AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

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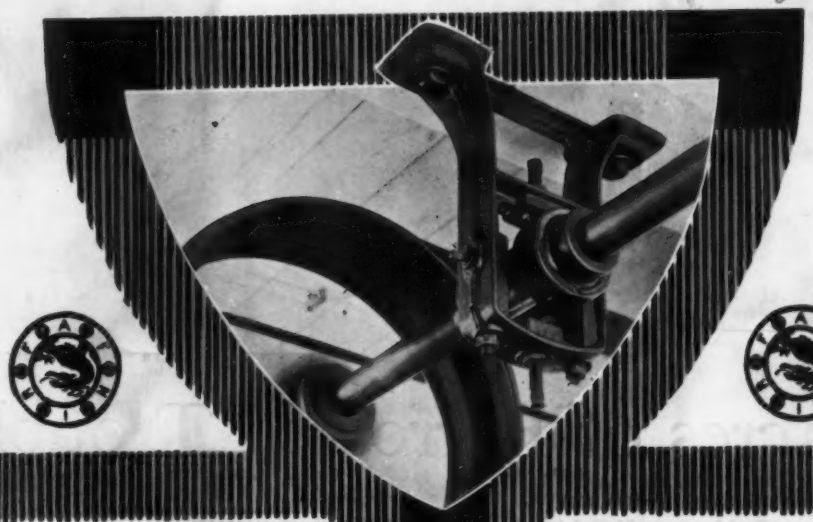

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DOUBLE BALL BEARING HANGER BOXES

You can cut a generous slice off your power bill, and at the same time cease to worry about future repairs, through the use of ***Fafnir Double Ball Bearing Hanger Boxes.*** Let us give you figures that will prove it. Moreover it is a simple matter to install ***Fafnir Double Ball Bearing Hanger Boxes*** and they are interchangeable with plain bearing boxes in any modern standard hanger frame, pillow block or post hanger.

Also ***Fafnir Self-Aligning Ball Bearings*** for all kinds of Textile Machinery.

THE FAFNIR BEARING COMPANY

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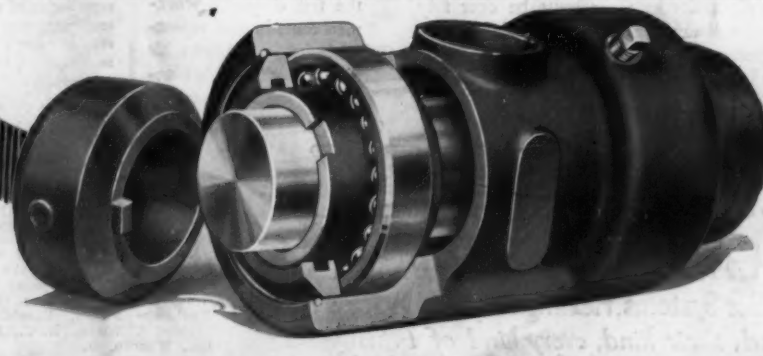

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Dramatized Facts out of The Day's Work

No. 4

Where the facts came from

Building the new New England Oil Corporation plant at Fall River, Mass., was a rush job from the first day. 68 miles of piping, covering 55 acres, were installed by Grinnell Company for the contractors, Unit Construction Co., St. Louis. When the piping was tested with men stationed all over the great works, only six leaks were reported to Mr. W. W. Boyd, Jr., Vice President and General Manager of the New England Oil Corporation — six leaks from 64,332 joints.

55 Acres of Borrowed Trouble

"The first tanker will dock here in just four months," declared the President, looking across the fifty-five-acre site of the gigantic new oil works. "By then we simply must be in full running order."

"The piping is what I'm worried about," mused the Production Manager, half to himself.

"It can't be done," exclaimed the Plant Engineer, whose hobby was his record under Goethals. "You've no idea how many unlooked-for things can come up in a job like this. No one ever dreamed of a whole hill sliding into the Panama Canal at Culebra Cut. Why, there's actually more than 68 miles of piping required here."

"I don't care if there's a hundred and sixty-eight, or if the Canal did fill up," flashed the President, "this job's got to go through on schedule, and it's going!"

"But in sixty-eight miles of this kind of piping," the Plant Engineer came back, "there are high and low pressure steam lines, acid, air and water lines, besides all the miscellaneous connections to stills, coking plants—why there must be over fifty thousand joints of one kind and another to make trouble."

The Consulting Engineer turned—started to reply. But again the President broke in with—"It can't take more than four months, remember—it simply can't."

"All right," persisted the Plant Engineer, "but if you rush construction like that, you can figure on giving me a big repair gang to tighten acres of leaky joints after the construction army is gone—"

"You're borrowing trouble, old man," smiled the Consulting Engineer. "I'll bet you a suit of clothes there won't be a hundred leaks in the whole job when it's tested out."

"Only a hundred leaks in 68 miles of rush, overtime piping? I'll go you."

It was hardly a fair bet for the Consulting Engineer to make. He knew where he was going for his piping—knew he would get a service practically undreamed of by those who haven't had actual experience with Grinnell Company. His confidence wasn't misplaced. The job was done on time, and after the test only six workmen came in and reported leaks. He won his suit of clothes with ninety-four leaks to spare!

GRINNELL BULLETIN

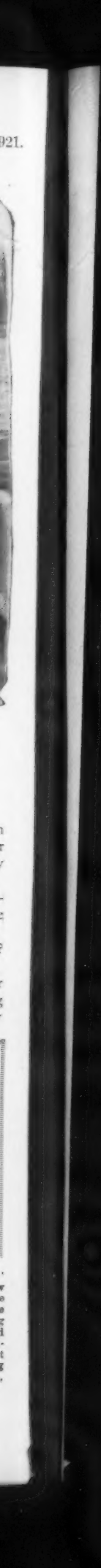
Handling a great piping contract requires skilled erecting crews, working in groups under unit foremen with a resident foreman supervising. The Grinnell field organization of 1300 men can give such service anywhere in the country. Piping requires more than ideas and materials. It requires men, organized like an army to take orders and execute them quickly.

This is why Grinnell Company can guarantee any piping installation it undertakes.

GRINNELL
INDUSTRIAL PIPING
Automatic Sprinkler Systems, Heating, Power and Process Piping

Your kind, their kind, every kind of Piping

Send for booklets, "Five Factors in Heating Costs" and "Standardized Sizing." The latter tells how the efficient, simply operated Constant Level Size Circulating System increases production in weave mills and pays for itself in size saving, time saving and the elimination of the spots, hard and soft-sized warps, the most frequent cause of "seconds." Address Grinnell Co., Inc., Executive Office 266 West Exchange Street, Providence, R. I. Fabricating Plants: Charlotte, N. C., Providence, R. I., Atlanta, Ga., Warren, O.



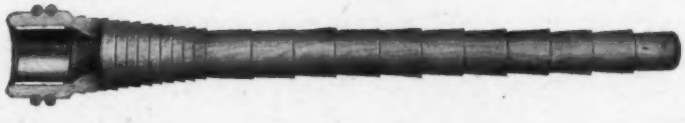
HASTINGS' PATENT METAL BUSHED NORTHROP LOOM BOBBINS

Reduce the annual expense for bobbins notwithstanding the added cost of the metal bushings

We can furnish either feeler or cone bobbins for Northrop looms and with any desired outside shape and to fit centrifugal clutch or other standard spindle.

DRAPER CORPORATION

ATLANTA GEORGIA HOPEDALE MASSACHUSETTS



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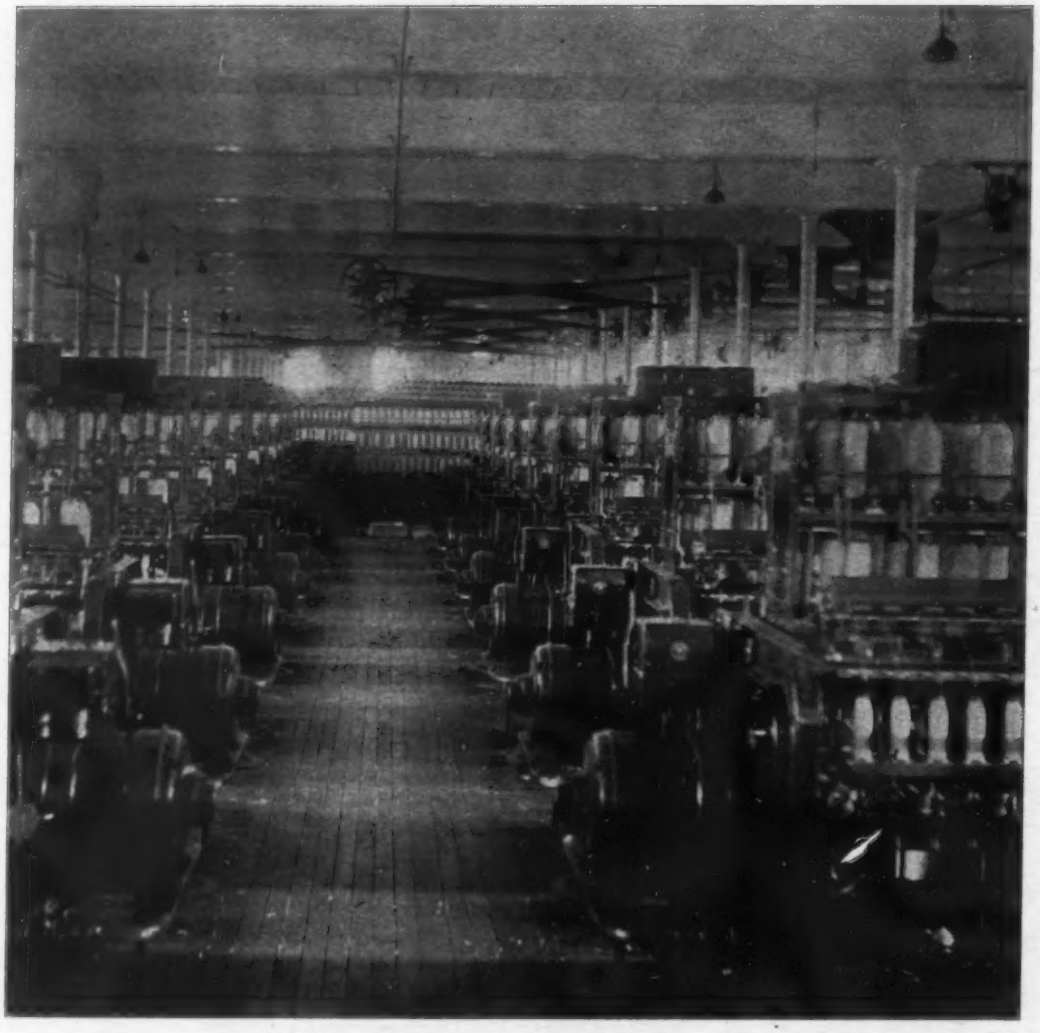
Hyatt Bearings on Spinning Frames



The eighteen Hyatt equipped spinning frames that are cutting operating costs at the Narragansett Mills, Fall River, Mass. The cylinder shafts are mounted on five Hyatt bearings per frame. The frames were made by the Mason Machine Works, Taunton, Mass.

HYATT BEARINGS FOR

Cost Little But They Save Much

It is just as advantageous to use Hyatt bearings on spinning frames as on looms and just as necessary if production is to be kept at minimum cost.

The use of improved textile machinery is an economically sound method of producing textiles at a lower cost per yard, and the use of Hyatt bearings is a worth while machinery improvement that effects real saving at little extra cost.

Applied to spinning frames Hyatt bearings reduce power costs, eliminate oil troubles and reduce the cost of oiling, because Hyatt bearings operate for two weeks to three months on one charge of oil. Give consideration to the possible saving in lubrication costs alone: Assume that it costs you 10c per day per plain bearing frame, oiling twice daily, including price of oil and time of oiler. Based on a 5-day week it costs you 50c per week or $26.00 per year to oil one frame. Hyatt Roller Bearing Frames will be perfectly lubricated if oil is added once in two weeks (usual practice is only four times a year), which means that the Hyatt roller bearings will require oiling only 1/20 as often as the plain bearings; 1/20 of $26.00 is $1.30, or a saving of $24.70 per year per frame.

The cost of having Hyatt roller bearings applied to your present frames or to new frames is about $35.00 per frame. Thus the Hyatt roller bearings more than pay for themselves in 18 months in oil saving alone.

And there are years of dependable power saving, oil saving operation yet to come. It will pay you to specify Hyatt roller bearings for any new spinning or twister frames and have them applied to your present frames.

Ask us for complete engineering information on Hyatt bearings for new textile machinery or for application to your present machinery.

Hyatt Roller Bearing Company, New York, N. Y.

TEXTILE MACHINERY

Profitable Operation

Proper Air Conditioning

MORE PROFITS FROM YOUR PRODUCT:

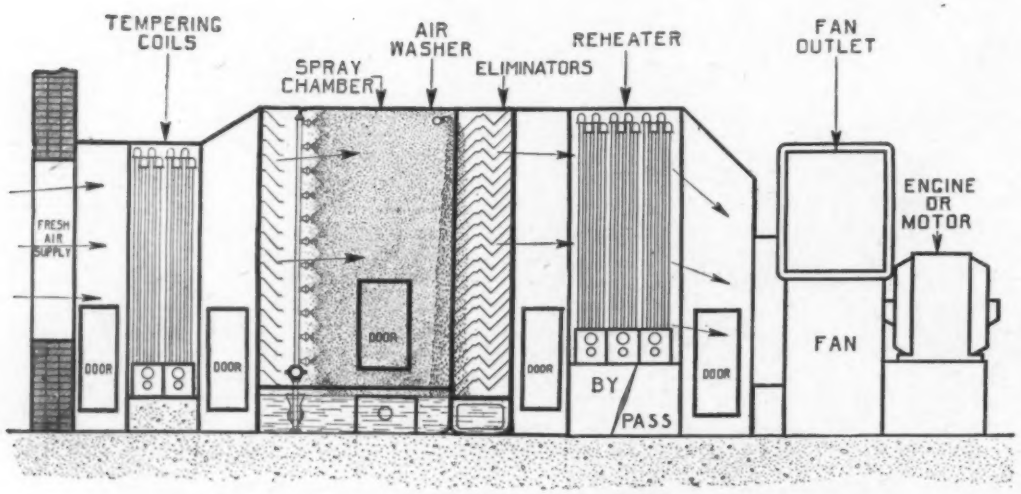
by eliminating lost moisture and thereby increasing the weight and dimension to the maximum and assuring perfect and uniform finish.

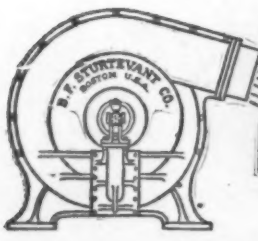
MORE PRODUCTION:

by eliminating static electricity, the cause of broken, twisted and knotted threads, and allowing machinery to run more efficiently on account of the absence of lint, dust, etc.

MORE HEALTHFUL OPERATIVES:

by keeping the air pure and clean, and at just the right temperature for ideal working efficiency. No fluff and fly means more healthful and productive operatives.





Sturtevant

REG. U.S. PAT. OFF.

PUTS AIR TO WORK

Depends on Perfect Air

A MILL is only as efficient as the air inside it. The most efficient mill executives realize that perfect air condition determines to a large extent the profitable operation of his mill.

Perfect air conditioning is climate-making to order on a commercial scale, a scale regulated to the size of your business. It provides heat, cold, a high percentage of moisture in the atmosphere, or its opposite in the exact degree required for maximum production. It insures uniformity of temperature and humidity, independent of weather conditions. It renders working and living conditions in the factory ideal,—that is, the air is not only tempered, but is washed and cleaned—is freed of all fine lint thrown off by the machines, and is also purified of dust and dirt. Air Conditioning is the road to results, the aid to production, the safeguard to quality, the important saver of time, the provider of health and satisfaction to the workers, the **efficiency producers,** unvarying in performance, which a score of different industries depend upon for increasing production and profits.

12% moisture in the raw material and 5% in the finished goods obviously means a very noticeable reduction in yearly profits. Does this condition prevail in your mill? Are you losing even 1% during manufacture? These are questions vitally important to your success. Answer them—fairly and squarely.

Efficient air makes efficient looms. A loom, although high priced, is relatively cheap in comparison to the **value** it produces. Increase this value through **more** product or **better** product and you decrease your overhead proportionately. It is absolutely essential that constant temperature and humidity be maintained throughout your mill in every step—from opener picker to cloth baler. Outside weather conditions are too unreliable for even production, and those who watch profit and loss statements recognize the importance of maintaining even temperature and sufficiently high humidity day in and day out.

Pick out the ideal climate for the interior of your mill and we will reproduce it 365 days in the year with a Sturtevant Air Conditioning System which will insure increased efficiency from start to finish with the added advantae of giving your employees healthy air to breathe.

B. F. Sturtevant Company, for over sixty years specialists in Putting Air to Work, are originators, leaders and largest producers in their field, which includes the production of Air-Conditioning Apparatus.

Together with the W. L. Fleischer engineering and construction organization we manufacture and install these systems. As "air specialists" and "doctors of climate" Sturtevant apparatus plus F. L. service will cure—economically and efficiently—all conditions of "sick" air. Scores of industrial plants have already benefited from the services of our "climate doctors." Manufacturing supremacy awaits now —the cotton manufacturer first to utilize this science in air conditioning.

Send for the Booklet "Climate Doctors"

B. F. STURTEVANT COMPANY

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AND ALL PRINCIPAL CITIES

This is the mark of W. L. Fleisher engineering and construction organization of New York, who join their expert field ability with the Sturtevant high standard of design and construction, and who guarantee to you satisfaction in the installation of air-conditioning systems.

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Textile Exhibitors Association, Inc.

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LEAVES STRIPPINGS IN EXCELLENT CONDITION FOR REWORKING

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FULL INFORMATION FURNISHED, SEND FOR CATALOG

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TEXTILE MACHINERY

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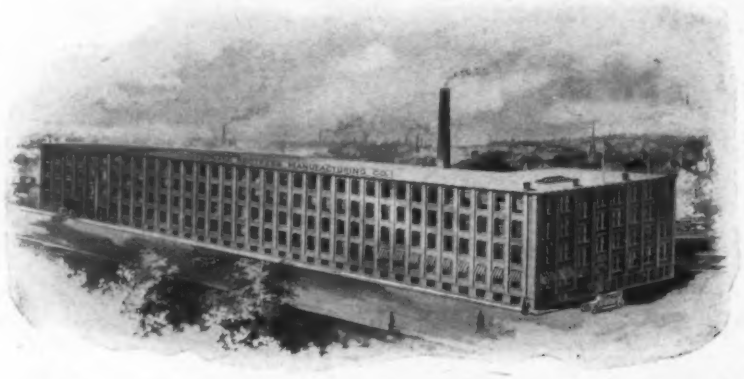
Napper Clothing
Heddles for any loom



Card clothing for cotton, woolen and worsted cards.

Cylinder Fillets
Doffer Fillets
Top Flats Reclothed
Stripper Fillets
Burnisher Fillets
Napper Clothing for All Styles of Machine and Cloth
Midgley's Improved Hand Stripping Cards, All Lengths and Sizes

QUALITY AND SERVICE ALWAYS GUARANTEED

GREIST

LOOM DROP WIRES

MADE of special Heddle Wire, Greist Drop Wires are given a "Satin Finish" by an exclusive process. They are also furnished copper or nickel-plated.

In addition to our many standard designs, we are prepared to make drop wires from your own specifications.

The manufacturing facilities of the Greist Manufacturing Company, since 1871 the largest manufacturers in the world of sewing machine attachments, are a dependable source of supply to rely upon for drop wires.

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F. W. Boyd, Manager.
339 Butler Exchange,
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The G. G. Slaughter Machinery Company,
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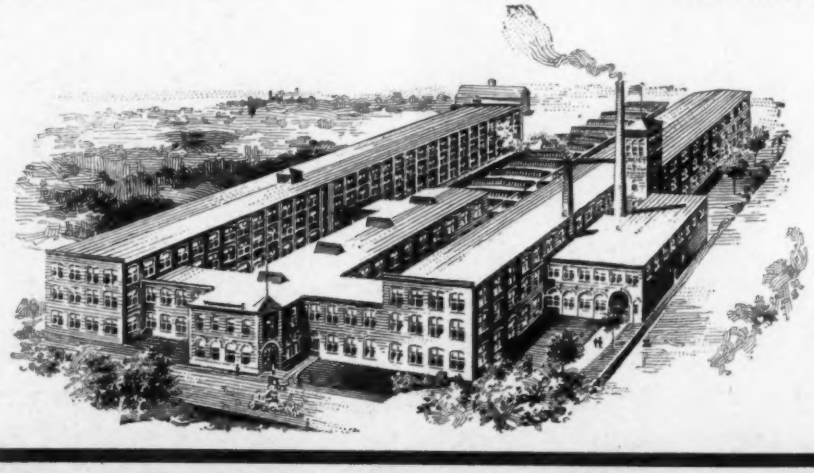
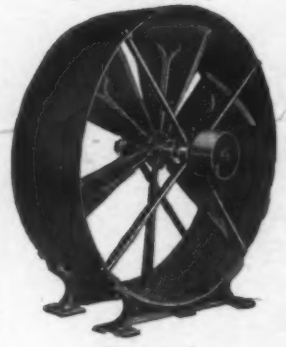
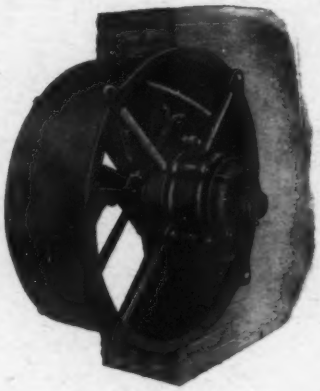


HOT WEATHER IS HERE!



Style J. C.



Style H. K.

A hot, stuffy work room is harmful to the health of your operatives. It also has an ill effect on their productiveness.

The **"All Steel Fans"** are constructed to remedy these unsatisfactory conditions. Either motor or pulley driven.

Style H. L.

Style O.

B. F. PERKINS & SON, Inc.

Holyoke, Mass.

The "Simplex" Knotter

$10.00

Low in Cost
but
Substantially Built

BARBER-COLMAN COMPANY

ROCKFORD, ILL., U. S. A.

BOSTON, MASS. GREENVILLE, S. C.

FIG.20.

Oblong Style.

Adapted to use alone or in connection with our Doff Trucks. Steel frames connected with Lane flexible eye-joints withstand hardest handling. Renewable hardwood shoes secured by rivets and steel plates.

ULTIMATE ECONOMY Demands

FIG.22.

Extra quality, strong heavy duck, our own weaving, used exclusively in Lane Baskets.

LANE CANVAS BASKETS AND TRUCKS

FIG.27

This Basket Truck embodies all the advantages of Lane Baskets, plus our specially designed Thread-guard Casters, which are non-clogging. Furnished in either stationary or swivel frame style of generous diameter and tread.

Standard American Equipment

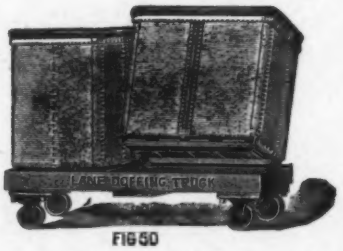
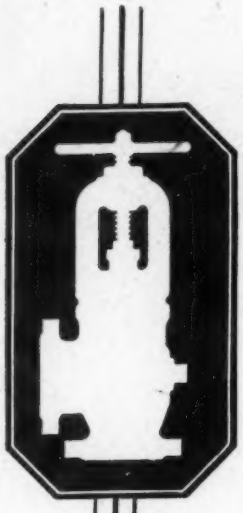


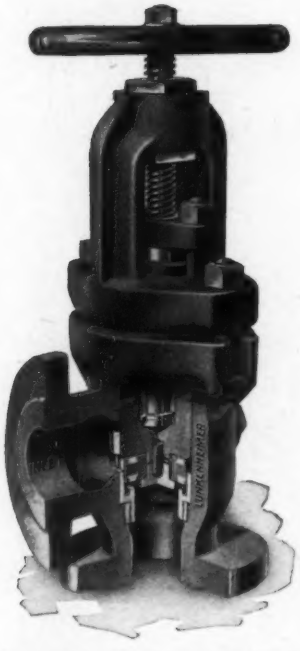
FIG 50

Lane Doffing Trucks are made to wear. Light weight, easy running. Caster equipment as shown or like Fig. 27 Truck.

W. T. Lane & Brothers, Manufacturers, Poughkeepsie, N. Y.



LUNKENHEIMER
"Duro" Blow-off Valves



"DURO" Blow-off Valves effectively meet the requirements of Boiler blow-off service.

The "DURO" *self-cleansing seat* insures tightness; reduces to a minimum the wear on the seating faces, prolongs their life, and prevents leakage which would impair the economical operation of the boiler plant.

The "DURO" disc is reversible, being provided with two seating faces, and the disc, together with all other parts are renewable. These advantages peculiar to "DURO" Blow-off Valves are the result of years of experience, which, combined with high quality materials and the LUNKENHEIMER method of manufacture, make them valves of unexcelled merit.

The LUNKENHEIMER Distributor in your locality can supply your valve needs. Acquaint him with the operating conditions of your plant. This knowledge will enable him to anticipate your requirements, preventing delay and possible shut-down when an emergency arises.

EQUIP WITH "DURO" BLOW-OFF VALVES.

THE LUNKENHEIMER CO.
"QUALITY"

LARGEST MANUFACTURERS OF
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The Original High Duty Humidifier

Take the spray head with its durable copper construction, its cleaning features, and amplify its capacity by the addition of a small electric motor and you have

The Electro-Blade Air Conditioner

High-Duty

It circulates nearly 2,000 cubic feet of air each minute through each head. It washes and cools the air.

Its evaporative capacity is the highest per dollar of investment that can be obtained. High-Duty results cannot be had by guesswork. Humidification is a science.

Get the scientific approach to your problem.

Profit by High-Duty Climate

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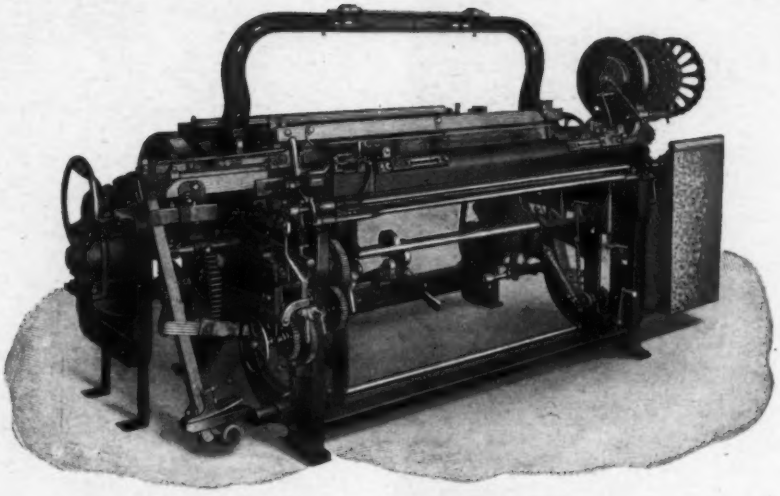
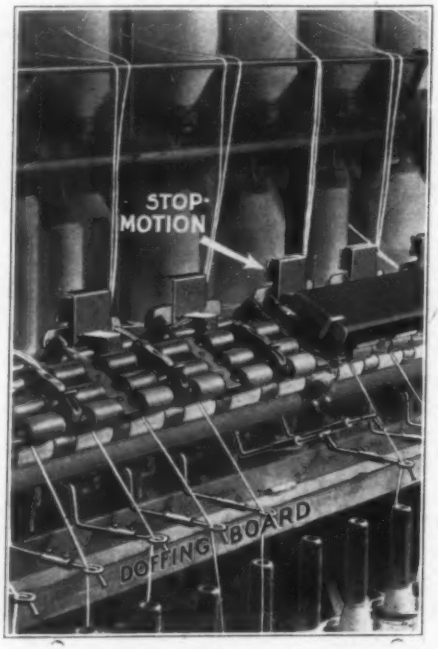
LOOMS STAFFORDS



STAFFORD AUTOMATIC BOBBIN-CHANGING LOOM
With High Take-up Roll. The same Loom can be furnished with Stafform Medium Take-Up

STAFFORD Automatic Looms can now be supplied with either shuttle or bobbin changing automatic features. They increase production, cut costs in half, and frequently more, and produce a quality of fabric unsurpassed.

THE STAFFORD COMPANY
WEAVING MACHINERY
READVILLE, MASS.
SOUTHERN AGENT, J. H. MAYES, CHARLOTTE, N. C.



The Greatest Improvement Since the Advent of Ring Spinning

1—reduces spinning waste 90 percent.

2—increases operatives' capacity 40 percent.

3—doubles the life of your rolls.

THE ECLIPSE STOP-MOTION DEVICE is the result of many months of experiment and testing under actual operating conditions. Many mills were skeptical about this device but after a thorough trial they agree with us that it is one of the great improvements since the advent of ring spinning and that it materially reduces manufacturing costs and improves yarn quality.

"THE ECLIPSE" STOP-MOTION DEVICE

Its simplicity and effectiveness is proved beyond doubt. The complete control of the spinning frame is placed in the hands of the operative. When an end breaks the stop-motion automatically covers the roving and instantly stops waste. It also operates when one or both bobbins are emptied, thus allowing all of the roving to run from bobbins. 90% saving is made in waste, not to speak of the labor saving and the prevention of mutilated bobbins.

No more rolls can become spoiled by laps. The leather or steel remains true and free from bruises. This decreases broken ends and produces a more even yarn. There is a 95% perfect condition of rolls and a 75% saving in top roll covering.

Actual operating conditions prove that this perfect device makes these worthwhile savings and furthermore saves 40% of labor cost of spinning, increasing the efficiency of spinning frame operatives wonderfully.

Let us send you full information.
A line today will bring it promptly.

Eclipse Textile Devices, Inc., Elmira, N. Y.

WHITIN MACHINE WORKS

ESTABLISHED 1831.

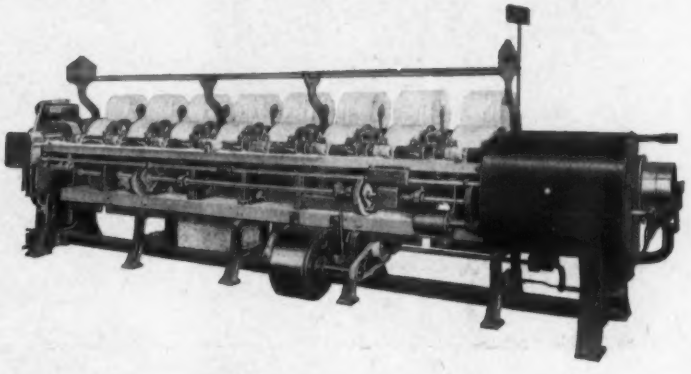
TEXTILE MACHINERY

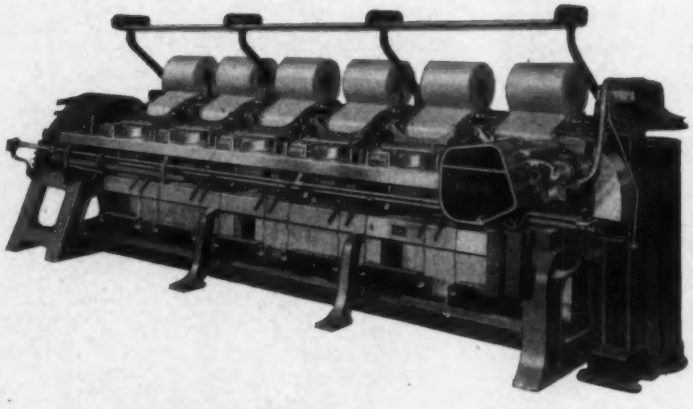
Makers of

COTTON COMBING MACHINES

Meeting all requirements of Textile Manufacturers

Model D-2 Comber
Whitin Type





Model E. Comber
Nasmith Type

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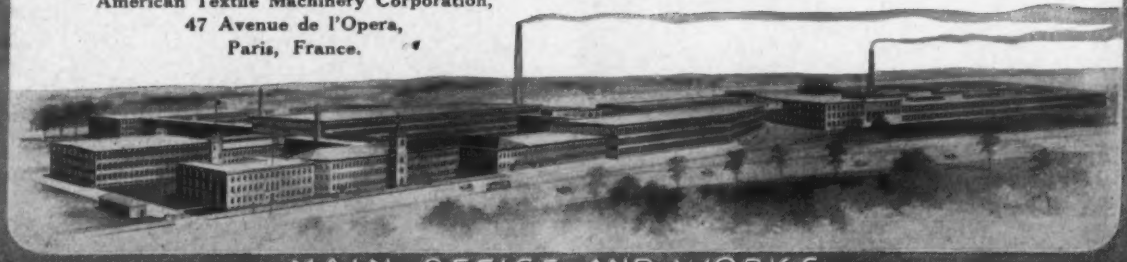
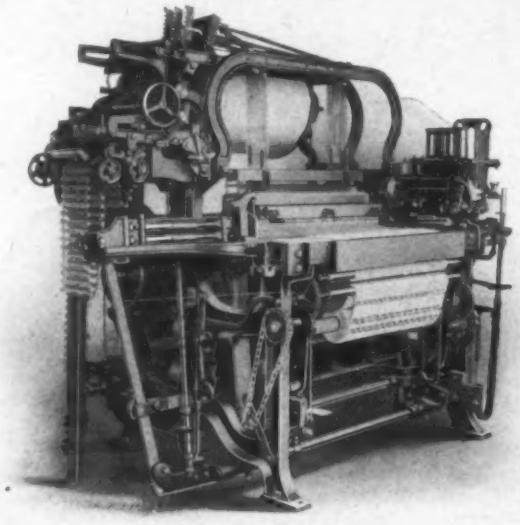


MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE, N.C.



Automatic Terry Towel Loom

The AUTOMATIC TERRY TOWEL LOOM shown here, is of the Dobby type and is used for weaving towels with colored borders.

A large number of these looms are running successfully with increased production per weaver and greatly reduced operating costs.

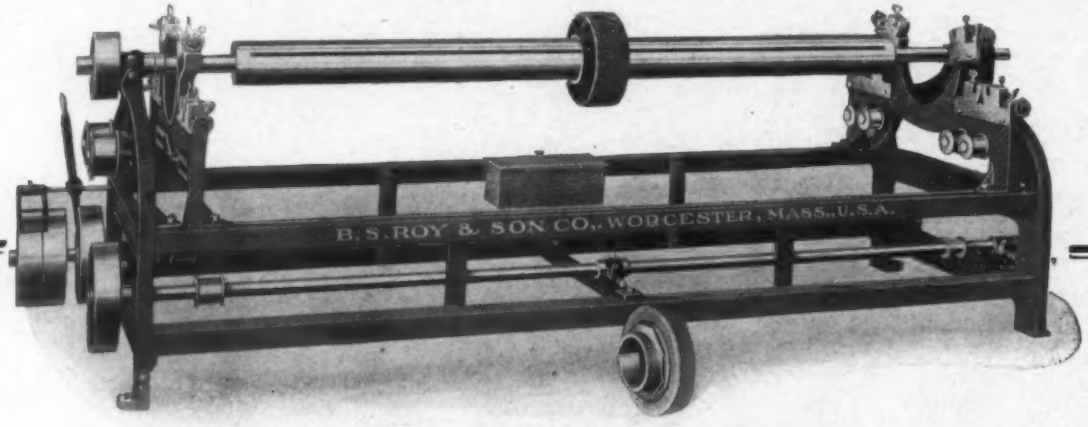
CROMPTON & KNOWLES LOOM WORKS

—WORCESTER, MASS.—

PROVIDENCE, R. I. PHILADELPHIA, PA. PATERSON, N. J.

ALEXANDER & GARSED—Charlotte, N. C.—Southern Representatives

American Textile Machinery Corp., 47 Ave. de l'Opera, Paris—Representatives for Continental Europe



ROY GRINDERS

IN EVERY SECTION OF THE TEXTILE INDUSTRY

Those who have used the Roy Grinder shown above understand why it has become a favorite among Textile Manufacturers.

Those who have not used this machine are invited to get in touch with those who *have* to obtain first-hand information.

Write for Bulletins

B. S. ROY & SON CO., Worcester, Mass.

Established 1868

E. M. TERRYBERRY, Southern Agent, 1126 Healy Bldg., Atlanta, Ga.

Keep Them Linked Together In Your Mind

BY MAKING humidification our special study for 33 years, and giving our whole attention and efforts to this one subject, we have perfected and standardized our systems until they are now recognized by men who know—mills that have compared systems—as the only source to secure PERFECT conditioning of air.

Humidification is only profitable to the mill when a judicious selection of the system is made and specialized experience used in its installation. Otherwise, the whole equipment may have to be rearranged or discarded.

Our systems are standardized—each one designed to meet one specific requirement. We do not believe in exploiting the merits of one method alone and claiming weaknesses and faults in all others, but our practice is to recommend the system that is best suited. We make a specialty of re-vamping old equipments, bring defective or antiquated systems to the highest possible efficiency.

Perfect air conditioning and American Moistening Systems are synonymous—keep them linked together in your mind.

No matter how perfect you may think your present system is—only specialists with years of experience can detect the faults, if they exist, and our reputation is sufficient guarantee that we never specify equipment other than is needed to bring the system to top-notch efficiency.

Make us "show you." Ask for our interesting data today.

EQUIPMENT TO MEET EVERY SPECIFIC REQUIREMENT

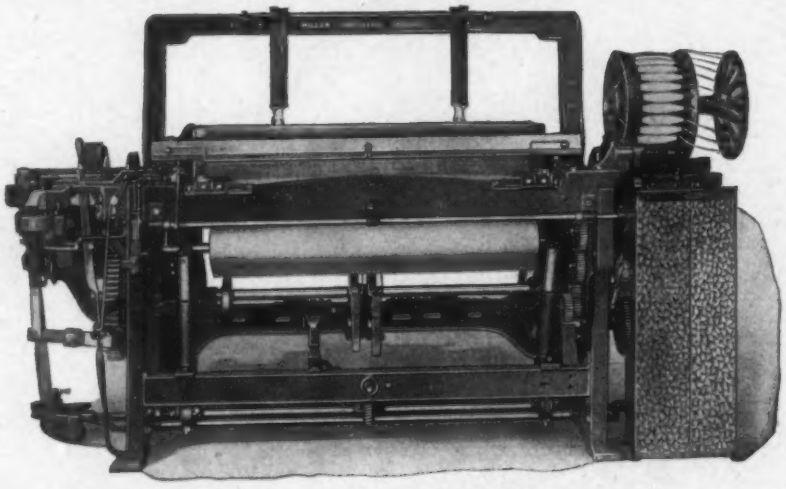
COMINS SECTIONAL HUMIDIFIERS
FAN TYPE and HIGH DUTY HUMIDIFIERS
VENTLATING Type of Humidifiers (Taking fresh air into the room from outside)
ATOMIZERS or COMPRESSED AIR SYSTEM
COMPRESSED AIR CLEANING SYSTEM
CONDITIONING ROOM EQUIPMENT
AUTOMATIC HUMIDITY CONTROL (Can be applied to systems already installed)
AUTOMATIC TEMPERATURE CONTROL

AMERICAN MOISTENING COMPANY
1888-1921

BOSTON, MASS. ATLANTA, GA.

Foreign Representatives:
W. R. GRACE & CO., New York, South America
ANDERSEN, MEYER & CO., Shanghai, China
W. J. WESTAWAY & CO., Hamilton, Canada

Mason Automatic Loom



With Battery, Warp Stop Motion, Feeler and Shuttle Lock

RANDOLPH CROMPTON'S PATENTS

Fewer Parts Standard Construction Rebounding Shuttles Overcome
Damage to Bobbins and Shuttles Prevented

We also build Revolving Flat Cards; Drawing Frames, Ring Spinning Frames; Duck Looms in various widths and weights; Silk Looms—Single Box and Two Box; Wide Sheeting Looms.

Mason Machine Works Co., Taunton, Mass.

E. HOWARD, Southern Agent, Greenville, S. C.

Is Your Cloth Bringing Maximum Profits?

Utmost profit cannot be secured from cloth that is underweight, and you know that from 8 to 15% of the normal weight is due to atmospheric content. How much of this 8 to 15% is missing from your product?

Cloth regain is more necessary now than ever before if profits are to be kept ahead of manufacturing costs, and manufacturers are realising the importance of restoring the cloth to its normal atmospheric condition, in order to regain weight and dimension and improve the handle and appearance.

The spraying method of regain has never proved satisfactory. Room humidification is insufficient, especially when cloth is rolled or piled.

The regain process that insures perfect results and maximum profits from your products is to be found in the

MANUFACTURERS COOLING & CONDITIONING MACHINE

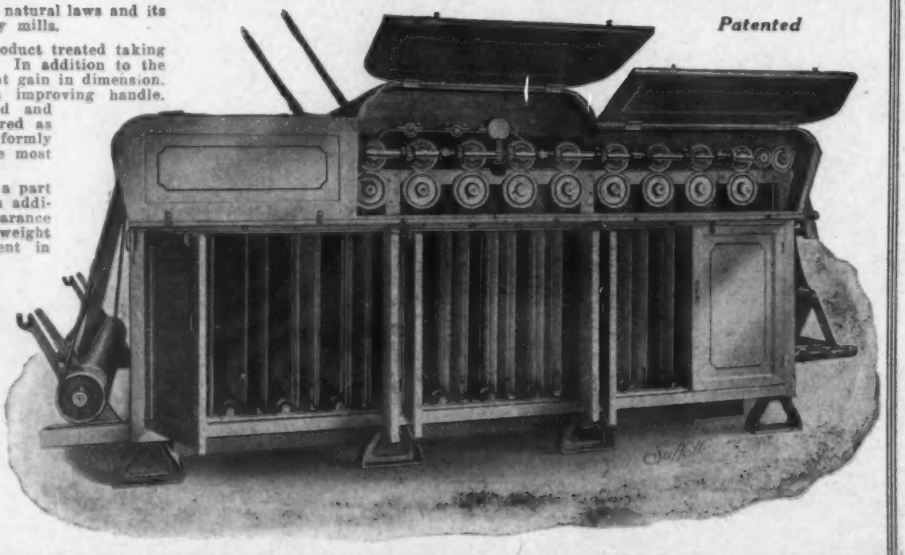
which is based on the operation of natural laws and its efficiency has been proven in many mills.

There is no possibility of the product treated taking on more than the normal content. In addition to the gain in weight, there is a permanent gain in dimension. Static electricity is removed thus improving handle. Variations in color are eliminated and perfect and uniform finish is assured as this process cools rapidly and uniformly and will not disturb or change the most delicate finishes.

This patented process should be a part of the equipment of every mill. In addition to greatly improving the appearance and handle, the tangible gains in weight and dimension are usually sufficient in money value to pay for the installation in a few weeks' operation.

Let us tell you about this perfect process. Your request will bring the information you want quickly.

Patented



Manufacturers Machine Company

Sales Department
120 Milk Street,
BOSTON, MASS.

Factory:
North Andover, Mass.

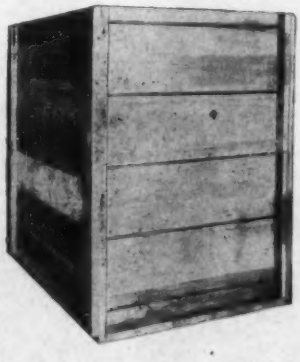
Wooden Packing Cases

All Styles
Manufactured from
Georgia Pine
White Pine
Poplar
Cypress
and Gum

The interlocking packing case, shown in the upper left-hand corner, has advantages over other packages, especially for carrying heavy materials. In the first place lighter weight material can be used in its construction on account of the interlocking reinforcement. It is harder to pilfer or break open than other packing cases.

We are now in position to give all orders for shooks prompt attention, and will be glad to quote prices and delivery dates on any cases you might require. Our prices are very much reduced, try us.

In addition to rectangular tanks, we manufacture a complete line of round tanks equipped with round iron hoops and malleable draw lugs.



All our tanks are manufactured from heart cypress tank stock and we guarantee them to hold water.

Your inquiry solicited.

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets

Box 1025 **Atlanta, Ga.**

SPECIALISTS IN MARKING MACHINES

Carton Marker.

The Carton Marker is for printing the size, descriptive names or colors, style numbers, or lot numbers, on the carton or the label, giving an absolute uniform result on all your containers; eliminating the poor and blurry mark that is usually obtained by the use of hand stamps.

Over 500 of these equipments are in operation.

Is adapted for marking the set-up, folding or telescopic carton.

Price of standard equipment, $300.

Textile Marker.

The Standard Textile Marker, designated as M-5 equipment, is for placing identification marks on pieces before going into the dye, bleach and finish, or any other operation in which the material requires marks for identification purposes, eliminating any possibility of error or short measure. Gives you a true check on your yardage. Price for standard equipment $300.

Coupon Marker.

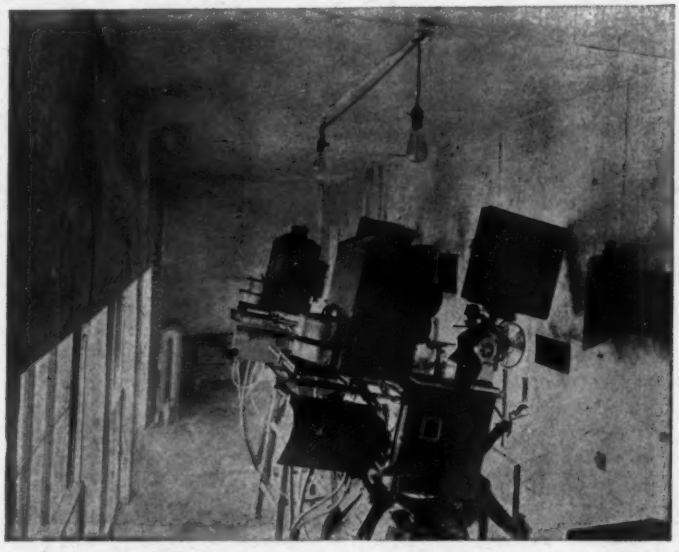
The Coupon Marker, used in connection with piecework payroll systems, where the coupon method is operated. Prints at the rate of 375 a minute. Has rotating type wheels which enable the operator to set various numbers at will, and is the solution for marking where this system is installed. There are over 400 of these in use.

Price of standard equipment, $250.00.

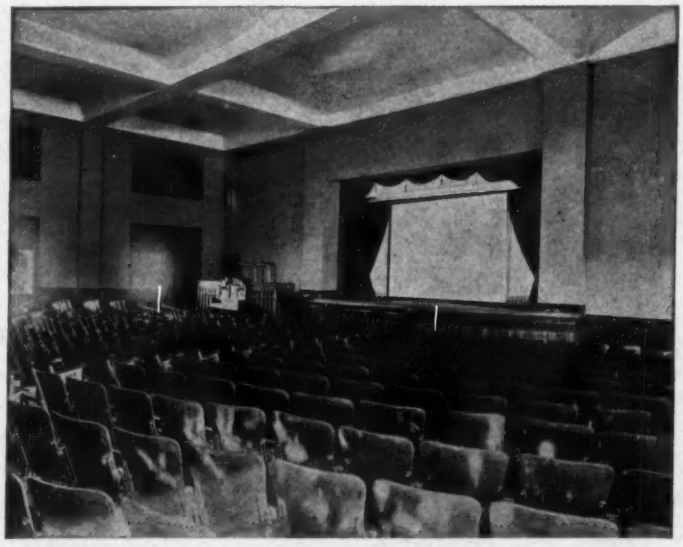
MARKEM MACHINE CO.

232 Summer St., BOSTON, MASS.

Better Motion Pictures For Textile Mill Employees



Showing Installation of Power's 6 B Motion Picture Machines in the Tucupau Mills Theatre.



Showing Interior of Tucupau Mills Theatre, Tucupau, S. C.

THE textile industry is demanding the best moving pictures for their employees, and that is why more

POWER'S PROJECTORS

are used by textile mills in the South than all other projectors combined.

Here Are a Few of the Mills Using "Power's"

Exposition Cotton Mill	Atlanta, Ga.
Bibb Manufacturing Co.	Columbus, Ga.
Bibb Manufacturing Co.	Porterdale, Ga.
Gainesville Cotton Mill	Gainesville, Ga.
Hamersham Mill	Habersham, Ga.
Hillside Cotton Mill	LaGrange, Ga.
Manchester Mill	Manchester, Ga.
Milstead Mill	Conyers, Ga.
Thomaston Cotton Mill	Thomaston, Ga.
Roswell Manufacturing Co.	Roswell, Ga.
Trion Company	Trion, Ga.
Rocky Mount Cotton Mill	Rocky Mount, N. C.
Rodman-Heath Cotton Mill	Waxhaw, N. C.
Pomona Mills	Greensboro, N. C.
Cleveland Mill & Power Co.	Lawndale, N. C.
Spray Cotton & Woolen Mills	Spray, N. C.
Issaqueena Mills	Central, S. C.
D. E. Converse Co.	Glendale, S. C.
Monoghan Mills	Greenville, S. C.
Woodside Mills	Greenville, S. C.
Pacolet Manufacturing Co.	Pacolet, S. C.
Tucupau Mills	Tucupau, S. C.
Victor Mills	Greer, S. C.
Victor-Monoghan Mills	Seneca, S. C.
Victor-Monoghan Mills	Walhalla, S. C.
Victor-Monoghan Mills	Jonesville, S. C.
Ware Shoals Manufacturing Co.	Ware Shoals, S. C.
Glenn-Lowry Manufacturing Co.	Whitmire, S. C.
Lanett Mills	Lanett, Ala.
Indian Head Mills	Cordova, Ala.
Selma Manufacturing Co.	Selma, Ala.
Central Mills	Sylacauga, Ala.
Tallahassee Falls Manufacturing	Tallahassee, Ala.

Our experience in Theatre Equipment is at your service

"WE HAVE A SPECIAL OFFER"

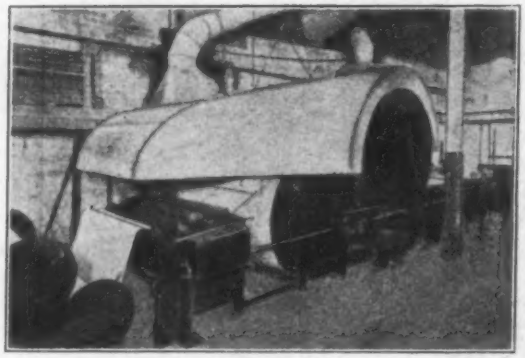
Southern Theatre Equipment Company

No. Nine Nassau St.
ATLANTA, GEORGIA

Eighteen Fifteen Main St.
DALLAS, TEXAS

A New Slasher Hood

---improves the sizing process



Patented by R. O. Pickens

Far better results from the sizing process are effected by the radical improvements embodied in the new *Pickens Slasher Hood.*

The large hood, completely covering both cylinders and the size box, collects and carries away all vapors, eliminates condensation on the yarn and aids in the proper drying of the dressed yarn.

The plan of construction of the hood is in accord with scientific practice and practical experience, making the *Pickens Slasher Hood* the most nearly perfect hood on the market today both from the viewpoints of efficient operation and results attained.

Built in sections of the best grade galvanized metal or copper, the hood may be shipped in knocked down form. This same feature facilitates repairs; only a screwdriver and pliers are needed to replace a rusted section.

Send for further information.

R. O. PICKENS SLASHER HOOD CO

Spartanburg South Carolina

Shambow Shuttles

RE-INFORCED with Red Vulcanized Fibre will outwear the best plain wooden Shuttle two in one and increase loom production and maintain, if not actually improve, quality. They will prevent an end an hour per loom from going down. Figure this out in additional loom hours added to your present producing capacity.

We are Southern Distributors for the SHAMBOW SHUTTLE CO., of Woonsocket, R. I., and maintain in Atlanta a complete Service and Advisory Department, in charge of Mr. A. W. Angell, a direct Factory Representative, whose entire time is at the disposal of the Southern Textile Mills, to help reduce your Shuttle troubles to a minimum. Let us explain to you the advantages of using Shambow Fibre Re-inforced Shuttles and Picker Sticks.

The **WALRAVEN** *Co.*

Machinery and Mill Supplies. ATLANTA, GA.

Saving 3952 Hours of Labor on CLEAN FLOORS in one department

A large textile mill in eastern Tennessee has proved the ***cash value*** of CLEAN FLOORS. Scrubbing the sewing room by hand formerly required eighty-eight hours of labor ***every week,***

But when the Finnell System of Power Scrubbing was installed only twenty-four hours of labor were required ***every second week.***

In a year the total saving came to 3952 hours of labor—in ***one department*** alone. Multiply this by the number of departments and the wage rate paid for scrubbing labor. You will see that the ***few hundred dollars*** invested in Finnell equipment ***save several thousand dollars*** every year.

Labor Not the Only Item of Saving

While Finnell scrubbing costs far less than hand scrubbing, its economy of operation is only one phase of its money-saving character.

It saves merchandise. It saves labor turnover. It saves in the maintenance of machinery. And it helps to increase the productivity of employees by improving their morale in providing CLEAN and healthier working conditions.

Hundreds of firms, large and small, in every line of business, are saving money by maintaining FINNELL-scrubbed CLEAN FLOORS.

FINNELL POWER SCRUBBING the Only CLEAN Method

Users declare that they have never really had CLEAN FLOORS until they used FINNELL equipment.

The steady, uniform pressure of the revolving ring of brushes actually pulls the dirt out of the crevices and pores. The best hand-and-knee scrubbing cannot deliver the consistent results over a large area that the FINNELL SCRUBBER gives. And hand scrubbing is considered more efficient than the other commonly accepted processes.

Hence money spent on any process other than the FINNELL SYSTEM is wasted, since it does not buy the CLEAN results it pays for.

Write Today for Proof

Will you continue to ***pay*** for CLEAN FLOORS and ***not have them.*** Or will you do yourself the justice of investigating the FINNELL SYSTEM as applied to your business? Let us show you how ***you*** can save money by making sure of CLEAN FLOORS. Write our Chicago offices today for full particulars. No obligation.

These Mills Save Money by maintaining CLEAN FLOORS

Altavista Cotton Mills
Dan River Mills
Carolina Cotton & Woolen Mills
Erwin Cotton Mills
Whitney Manufacturing Co.
Duncan Mills
Tucapau Mills
Pacific Mills
Hamilton Carhardt Mills
Cannon Manufacturing Co.
Loray Mills
Wiscassett Knitting Mills
Union Buffalo Mills
Salisbury Cotton Mills
Appalachian Mills
Fortsman & Huffmann
Crown Manufacturing Co.
American Thread Co.—5 Mills
Arlington Mills
Wood Mills
Shenandoah Mills
Viscose Manufacturing Co.
Aberfoyle Manufacturing Co.

There's right equipment for YOUR mill

FINNELL Power Scrubbing Equipment is made in sizes for all needs, from the small mill to the very largest. When writing for information, please state number of square feet of floor space to be scrubbed.

FINNELL SCRUBBER

It SCRUBS Electrically!

AMERICAN SCRUBBING EQUIPMENT CO.

Also manufacturers of Finola Scouring Powder

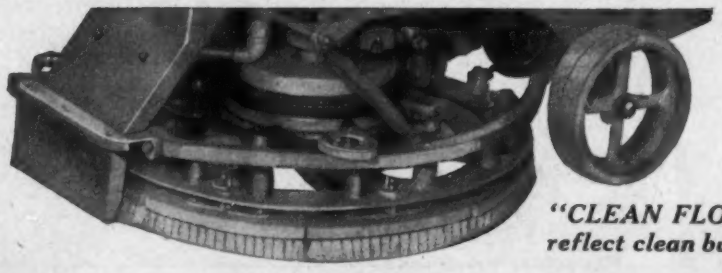
General Offices: 188 N. Wabash Ave., Chicago Factories: Hannibal, Mo.

DISTRICT OFFICES

ATLANTA	BUFFALO	DENVER	LOS ANGELES	NEWARK	PHILADELPHIA	SALT LAKE CITY
BALTIMORE	CHICAGO	DETROIT	LOUISVILLE	NEW ORLEANS	PITTSBURGH	SAN FRANCISCO
BOSTON	CINCINNATI	INDIANAPOLIS	MILWAUKEE	NEW YORK	PROVIDENCE	SEATTLE
	CLEVELAND	KANSAS CITY	MINNEAPOLIS	OMAHA	ST. LOUIS	

FINNELL SYSTEM

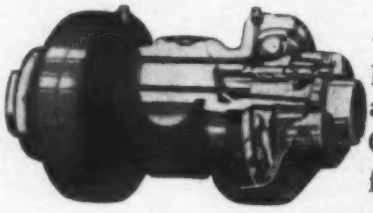
OF POWER SCRUBBING



"CLEAN FLOORS reflect clean business"

BALL BEARINGS Chapman

YOU PAY FOR THEM WHETHER YOU BUY THEM OR NOT



A Chapman installation, when completed, will increase your production at less expense, through the ability of Chapman Ball Bearings to overcome friction.

Scores of actual TESTS mads in Chapman-ized plants show actual savings of 15% to 40% on power costs—more than 4000 industries in America have put them to the most severe tests.

Convincing evidence mailed upon request.

They Fit Your Present Hanger Frames.

TRANSMISSION BALL BEARING COMPANY

1061 MILITARY ROAD BUFFALO, N. Y.

BRANCHES: New York Chicago Philadelphia Cambridge, Mass. Toronto, Can.

Representatives in the principal cities.

A Real Investment—Not an Expense

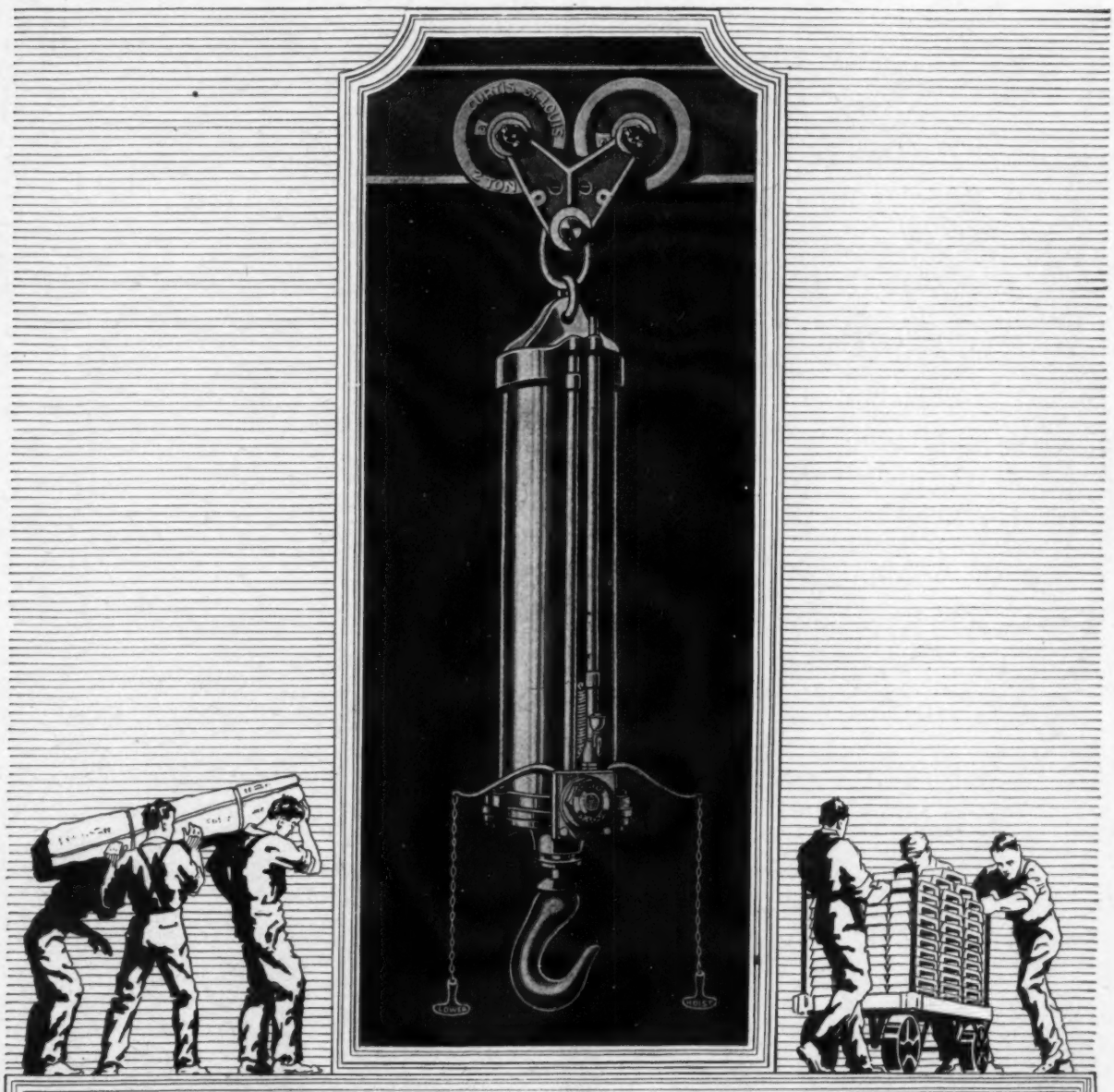
Decrease your liability for industrial accidents.
Decrease time lost through temporary incapacity of your workers.
Decrease needless suffering through minor injuries and prevent minor injuries from developing into serious cases.
Increase morale and loyalty among your employees and give you opportunity to show your interest in the welfare of your workers.

We have equipped First Aid Rooms for over four hundred factories and mills who have appreciated these facts.

A first-aid room for your employees will pay good returns on the investment in several ways. It will reduce insurance premiums to the minimum.

Thomas First-Aid Room and Hospital Equipment is a worth while investment. Let our Southern Representative show you why. Write to

Walter Scott,
Ottaray Hotel, Greenville, S. C,
F. H. THOMAS CO.,
691 BOYLSTON ST., BOSTON, MASS.



CURTIS AIR HOISTS and TROLLEYS
SAVE MAN-POWER

CURTIS Trolleys are constructed with self-equalizing steel side frames and large inclined wheels fitted with shock-absorbing Hyatt Flexible Roller Bearings—making them easy to start—easy rolling and long lasting.

CURTIS All-Steel Air Hoists, in design and construction, present the perfected results of 25 years of manufacture. They are simple, safe and economical for light and medium loads. Capacities, 800 to 20,000 lbs.

CURTIS PNEUMATIC MACHINERY COMPANY

1571 Kienlen Avenue ST. LOUIS, U. S. A.

Branch Office: 532-R Hudson Terminal, New York City

COCHECO Belting

Something for nothing traps only the unwary. The careful buyer expects something for something.

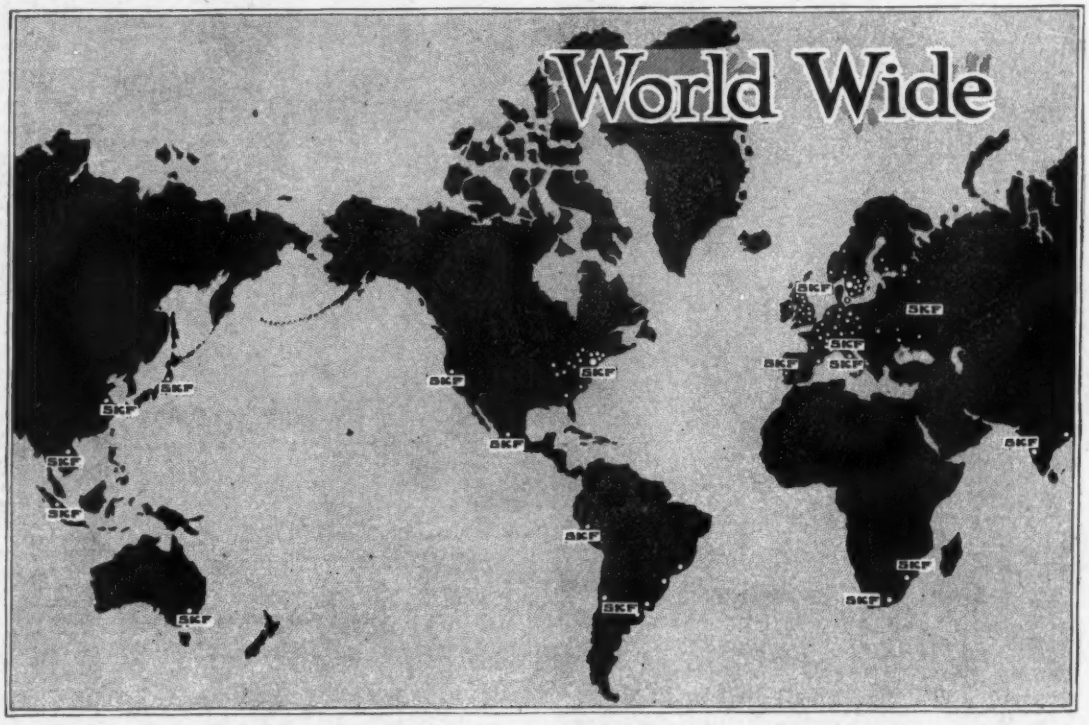
Cocheco Belting—made from the best belting leather, curried, finished and tested by processes developed in 75 years of experience—is not cheap belting. Quality and length of service, however, make it an economical belting. Cocheco Belting has always been made with one idea—to provide the best possible for general transmission purposes, at an equitable cost. Cocheco users know what belt service means. Do you?

I. B. WILLIAMS & SONS

DOVER, NEW HAMPSHIRE

BOSTON, MASS., 157 Summer Sreet. NEW YORK, N. Y., 71-73 Murray Street
CHICAGO, ILL., 14-16 N. Franklin Street

The technical knowledge that comes to you from SKF engineers is



as it is the sum of the data gathered by SKF organizations in all industrial countries.

This fund of engineering information we bring to the fabrication of all products bearing the mark SKF and the operation of those industries which we are requested to supervise. In order that complete reliance may be placed in the endorsement expressed by the mark SKF it is necessary not alone that we control and supervise each step in the manufacture of a product but also its final installation.

Because every effort is made to assure the most satisfactory use of products marked SKF we welcome requests for information concerning their proper application and maintenance.

Textile manufacturers should feel that this technical knowledge is always available. You are urged to use it freely without any sense of obligation.

SKF Industries, Inc.
165 Broadway, New York City

Supervising at the request of the stockholders.
- The Hess-Bright Manufacturing Co.
- The Skayef Ball Bearing Co.
- Atlas Ball Co.
- Hubbard Machine Co.
- SKF Research Laboratory

620

The Picker Room is the Cornerstone of the Mill

For even-running, uniform work you must have uniform lap from the finishers. Whether you get it or not depends mainly on how the eveners are working. Strom bearings with their large balls and deep grooved raceways help make the eveners work effectively.

When a thin place passes over the evener roll, the evener mechanism tries to speed up the feed by shifting the drive belt farther down on the small end of the cone pulley. The farther down on the pulley it goes, the greater is the tendency to slip, so that the feed roll may actually be slowed up instead of speeded up, and a very thin place results.

The less load there is on the evener, the less belt slip there will be, and better laps will be obtained. A big part of the load can be taken off the evener by putting Strom ball bearings on the apron rollers. They not only make the evener work better, but make the aprons last longer.

These bearings may be obtained from our Southern Distributor, the Aldrich Machine Works, Greenwood, S. C.

The U. S. Ball Bearing Mfg. Co.

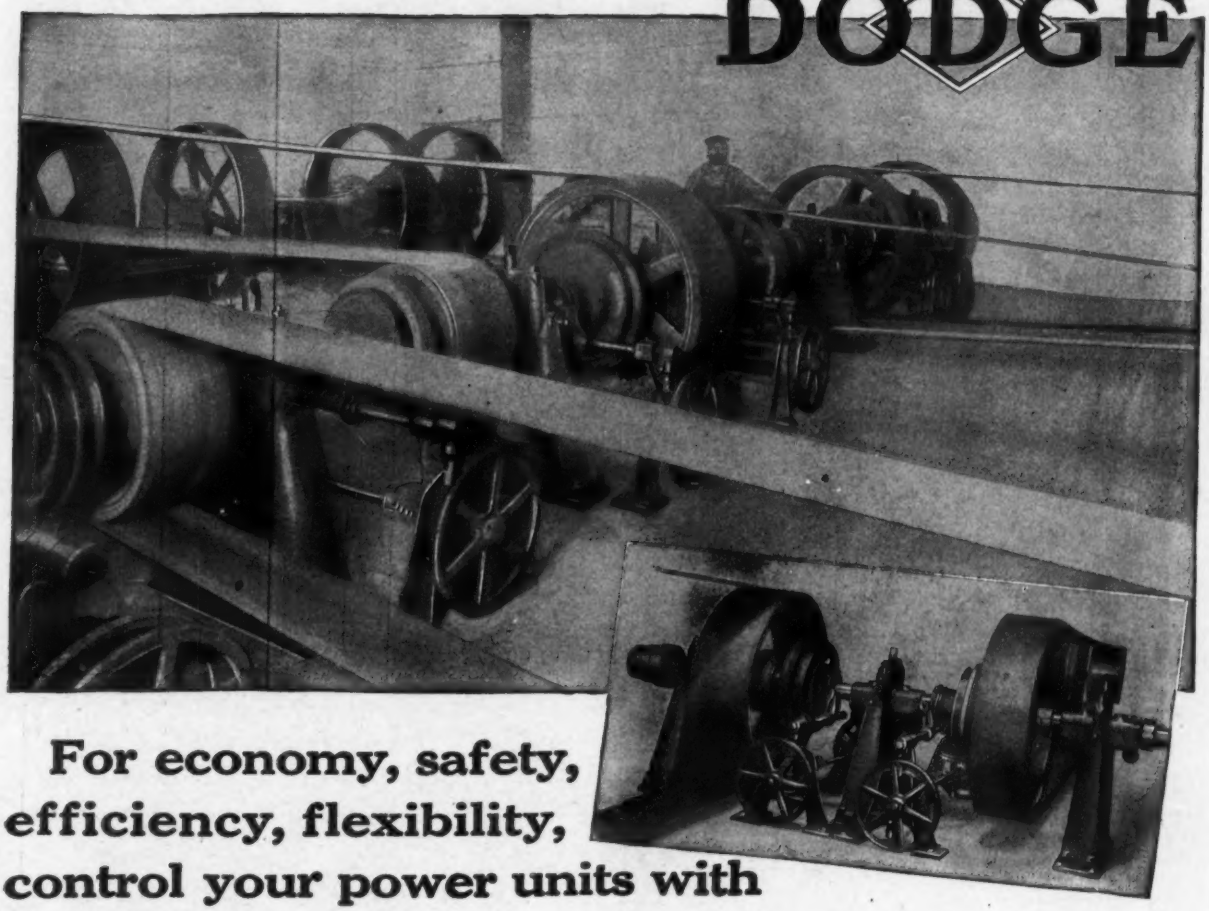
(Conrad Patent Licensee)

4544 Palmer St., Chicago, Illinois.

143

Strom BEARINGS

DODGE



For economy, safety, efficiency, flexibility, control your power units with

Dodge Friction Clutches

The manufacturer who does not make use of every device to prevent waste of power and labor is soon going to find himself facing a balance on the wrong side of his ledger.

Every department, line of shafting or machine that runs when not actually engaged in production wastes power. Every shutdown of an entire department to make some minor repair or adjustment wastes time.

Dodge friction clutches put every department, line of shafting and machine in your factory under individual control.

There's a Dodge clutch for every power unit from 1 H. P. to 1,000 or more H. P.

They will pay you bigger dividends than any other piece of machinery in your entire transmission system.

Place your order through the Dodge dealer. He can serve you promptly from his own stock or from one of our fifteen warehouses.

Dodge Sales & Engineering Company

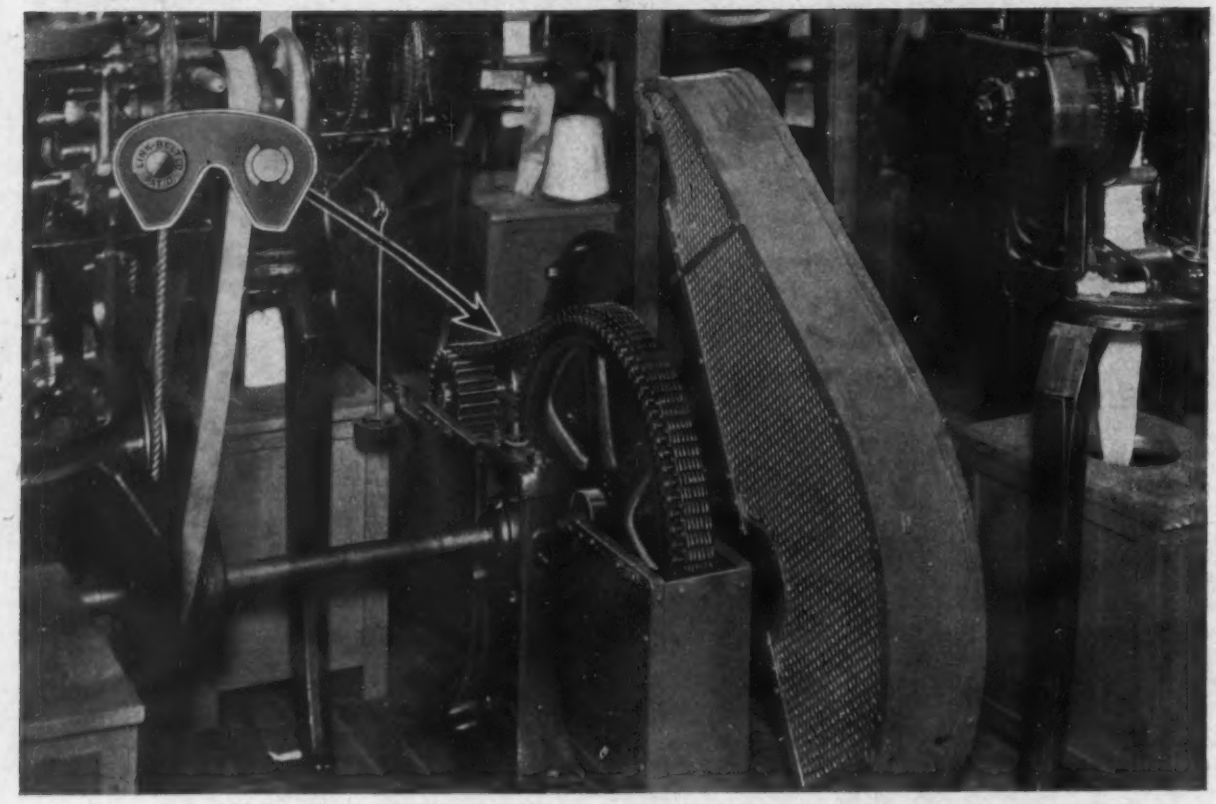
Distributor of the products of the Dodge Manufacturing Company

General Offices: Mishawaka, Ind. Works: Mishawaka, Ind., and Oneida, N. Y.

Dodge Branch Warehouses

Chicago New York Philadelphia Boston Cincinnati Pittsburgh Dallas St. Louis Minneapolis Atlanta Newark, N. J. Providence, R. I. Seattle

LINK-BELT
Silent Chain Drives



Link-Belt Silent Chain Drive to knitting machine lineshaft, Phoenix Knitting Works, Milwaukee, Wis.

"I am an enthusiastic advocate of the Link-Belt Silent Chain Drive. Having seen it effect a tremendous production economy here in our own plant, i have been in a position to form conclusions, based solely upon results obtained".—Charles Bindrich, Phoenix Knitting Works, Milwaukee, Wisconsin.

Mr. Bindrich further states: "I cannot recall a single troublesome moment during our three years of Silent Chain experience. These drives are just as positive in constant service rendered as in power delivered to our machines. Production losses due to belt breakage having been completely eliminated".

We venture that you too would be as enthusiastic over the results obtained from the use of Link-Belt Silent Chain Drives, if you employed them in your mill. Let us install one drive, and then watch for results. Send for booklet No. 425.

728

LINK-BELT COMPANY

PHILADELPHIA

New York	299 Broadway	Huntington, W. Va.	Robson-Prichard Bldg.
Boston 9	49 Federal St.	Cleveland	420 Kirby Bldg.
Pittsburgh	1501 Park Bldg.	Detroit	4310 Woodward Ave.
St. Louis	Central Nat'l Bank Bldg.	Minneapolis	418 S. Third St.
Buffalo	647 Ellicott Square	Kansas City, Mo.	306 Elmhurst Bldg.
Wilkes-Barre	54 Nat'l Bank Bldg.	Seattle	820 First Ave., S.

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Portland, Ore.	First and Stark Sts.	Denver	Lichtroth, Shubart & Co., Boston Bldg.
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Los Angeles	167 N. Los Angeles St.	New Orleans	C. O. Hine, 604 Carondelet Bldg.
Atlanta	707 Citizens and Southern Bank Bldg.	Birmingham, Ala.	
Toronto, Can.	Canadian Link-Belt Co., Ltd.		S. L. Marrow, 720 Brown-Marx Bldg.
Montreal, Can.	Canadian Link-Belt Co., Ltd.	Charlotte, N. C.	J. S. Cothran, Com'l Bank Bldg.

INDIANAPOLIS

BY INVITATION MEMBER OF

To have continued to successfully produce and market

THE T. B. WOOD SONS CO. LINE

of Power Transmission Appliances exclusively since 1857, is in itself an indication of the high regard that the American Manufacturers have for our product and the service that goes with it.

With our organization, the making of Pulleys, Hangers, Couplings, Friction Clutches, etc., has become an art of which we are justly proud.

A special line for **COTTON MILLS.**

May we be permitted to figure on your Transmission requirements?

T. B. WOOD'S SONS CO.
CHAMBERSBURG,
PENNA.

THE T. B. WOOD SONS CO. LINE

The Sign of Efficiency

MORSE DRIVES

SILENT CHAIN

THE MORSE "ROCKER JOINT"

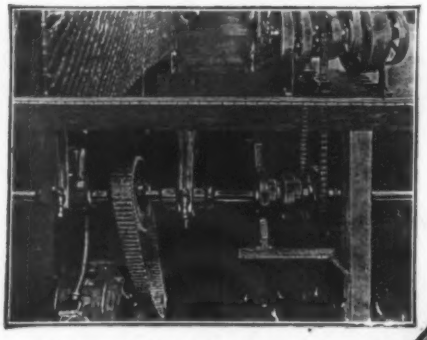
The Sign of Durability

Positive as Gears

Flexible as a Belt

Longer Life

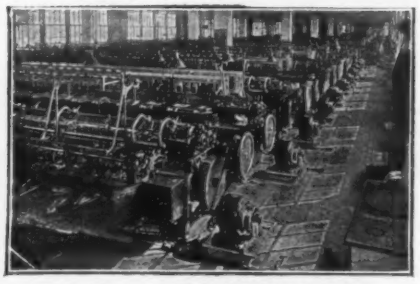
Some Applications to Textile Machinery



Motor and Lineshaft Beneath Floor. Drive to Twisters.

A **Morse Chain** for Every Drive

Individual Motor Drive to Knitting Machine

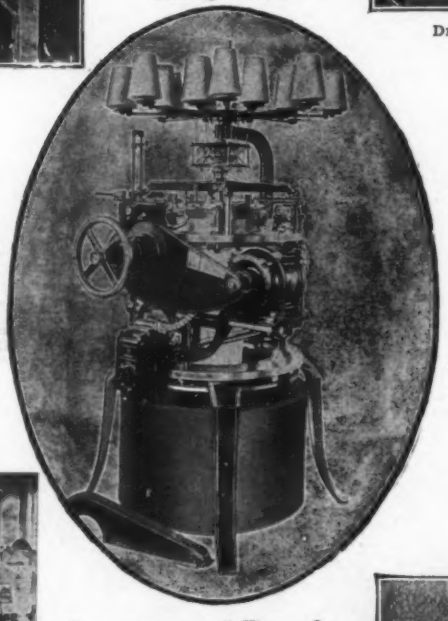


Drive from Motor to Full Fashion Hosiery Machines.

INCREASED PRODUCTION

Better Manufactured Product

Better Working Conditions



The Cost of Application is not Excessive.

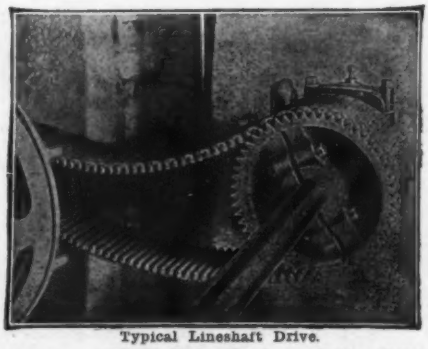
The Return on the Investment is a Large one.

Changing Over to Chain Drive.

Service and Results are Remembered Long After The Price is Forgotten

Let us have your problem. You will be in no way obligated. Benefit by Morse Service as others do.

Write Today for Technical Textile Booklet.



Typical Lineshaft Drive.

MORSE CHAIN CO.

MORSE ENGINEERING SERVICE

Largest Manufacturer of Silent Chains in the World

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ITHACA, N. Y.

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PHILADELPHIA, PA. ..... 302 Harrison Building

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Morse is the Guarantee Always Behind the Efficiency, Durability and Service.

The Strength of a Belt Is In Its Lacing

Sudden Breaks Mean Production and Time Loss

That Weak Joint May Cost a Thousand Dollars to Repair

The sudden stoppage of the machinery in a factory always means a distinct loss. When machinery is idle, production stops; the morale of the workmen is temporarily broken. All this because of a poor job of belt lacing—or poor lacing.

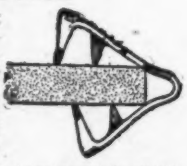
Avoid This Loss—Lace Belts Right

The above condition exists wherever steps have not been taken to correct the recurring, costly evil of poor belt lacing. This loss, this waste, is all unnecessary. No manufacturer is compelled to stand this tribute to carelessness or ignorance—if system and care and knowledge be applied to the belt lacing. It is as important as the selection of a belt or checking costs on belt overhead.

There is a valuable guide to proper belt lacing and the sooner Purchasing Departments discover it, from that point on belt troubles will be uncommon visitors — as far as the lacing is concerned.

Preference Given to Alligator Steel Belt Lacing by Belt Men

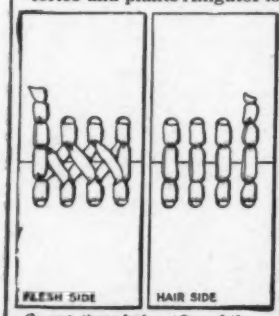
A belt lacing that has proven successful whenothershave failed is Alligator Steel Belt Lacing. Its healthy, unyielding grip on belts of all kinds, makes and sizes, has forced the admission that here is at last a belt fastener that fulfills all the promises of the manufacturers.



Actual size of No. 25 Alligator for single leather or 4-ply fabric 3-16 to 9-32 thick. Note double staggered teeth.

Makes a Smooth Flexible Joint

Today, in over a hundred thousand factories and plants Alligator is whirling over the pulleys—the master of belts. It never lets go. It has replaced the imperfect with the perfect; a flexible joint which hugs the pulleys as closely as the belt itself, and makes possible the use of either side of the belt.

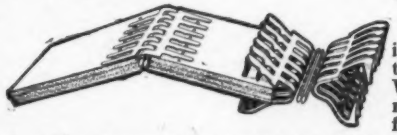


Correct thong lacing. One of the best until Alligator came.

The sectional frictionless, steel rocker hinge pin helps to make this flexibility a notable fact.

Punching Holes in Belt Is Wrong Method

The greater strength of the Alligator laced joint has been verified in hundreds of thousands of tests. One reason why is that where other metal fasteners weaken the belt by cutting most of the lengthwise fibres of the belt, the fibres that carry the strain, the teeth of the Alligator Lacing penetrates the belt lengthwise and clinches across the long burden carrying fibres leaving them intact, as the teeth pass between them.



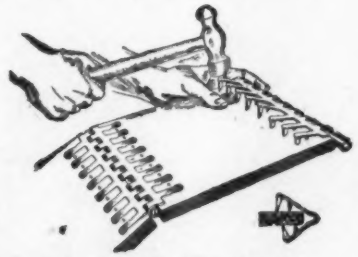
Showing teeth disengaged with steel rocker hinge pin. And in proper position back to back. Also completed joint.

The breaking strength of an Alligator laced belt is, therefore, at a considerable higher figure, naturally, than those whose strength is graduated by the number of punch holes made for rawhide lacing or some metal fasteners.

It is no wonder then that the well informed belt expert, purchasing agent, belt manufacturer and the intelligent shopman swear by Alligator as the most economical, durable and generally satisfactory all-around belt lacing on the market.

Nothing Needed But a Hammer

Comparison with other lacing processes will at once distinguish Alligator as the lacing most quickly and easily applied, even by an inexperienced workman.

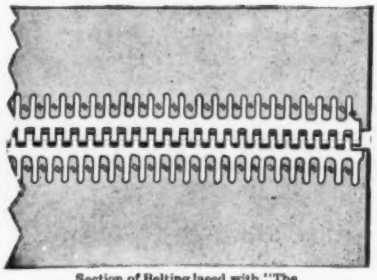


Nothing needed but a hammer to apply it—and you already have a hammer.

There's nothing needed but a hammer, and three minutes is the average time required to make a neat and perfect joint in a workmanlike manner — a joint that holds with a permanent tenacious, vise-like, unyielding grip on all belts from tape to 5/8-inch thickness.

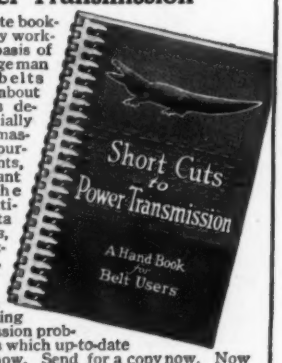
Good Judgment Dictates a Proven Lacing

There is no question but that Alligator Steel Belt Lacing will go farther in reducing annual belt overhead and losses of time and production if consistently used. With belt ills, due to lacings, reduced to a minimum by a universally approved belt fastener, the cost of maintenance will quickly take a consequent downward trend. To Alligator it means nothing more than a duty well done.



Section of Belting laced with "The Strongest Belt Lacing on Earth"

Get Free Copy of Our Belt Book, "Shorts Cuts to Power Transmission"



This complete booklet was carefully worked out on a basis of what the average man who handles belts needs to know about them. It was designed especially for engineers, master mechanics, purchasing agents, foremen and plant executives. The book gives practical working data for calculations, care and selection of belting, tells how to estimate for new belts; about the knack of meeting knotty transmission problems—all things which up-to-date men should know. Send for a copy now. Now in use in engineering and technical schools—in quantities to provide for each student.

Do you wish to know further details as to prices, sizes, etc., then fill out blank and mail in today. No obligation.

Flexible Steel Lacing Co.

4619 Lexington St., Chicago

135 Finsbury Pavement, E. C. London

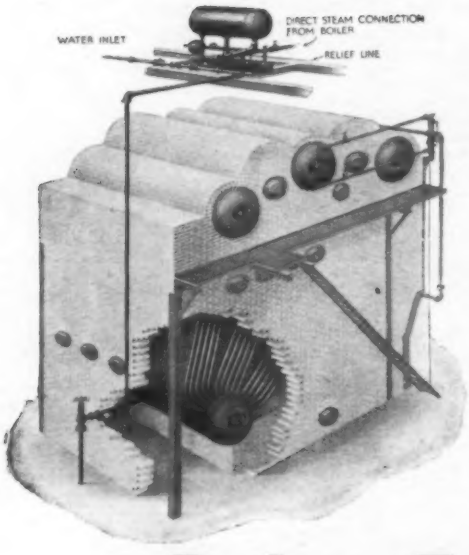
Flexible Steel Lacing Co.
4619 Lexington Street, CHICAGO

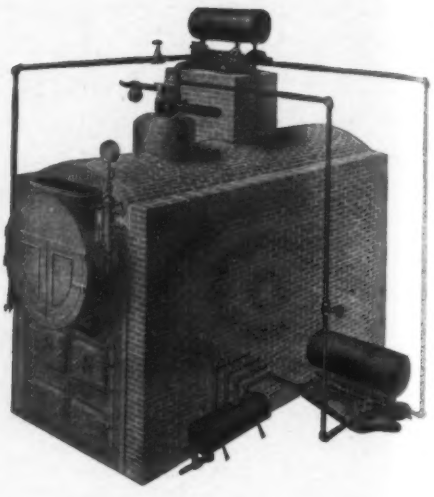
Gentlemen: — Without obligation on my part kindly send me price lists, and complete details on Alligator Steel Belt Lacing and indicate a convenient source of supply. Also your book "Short Cuts to Power Transmission."

Firm Name.....

Address.....

Name of Inquirer.....





Reduce Fuel Consumption in Every Type of Steam Plant

No matter whether your boilers are large or small—water tube or fire tube—the Morehead Back-to-Boiler System will effect a big saving in your operation costs.

By draining steam heated surfaces — steam heated machinery and heating systems of all condensation, and returning the boiling hot water direct to your boilers, the Morehead System not only decreases fuel consumption 20 to 50 per cent, but increases the efficiency of your steam heated equipment.

Production is often increased 25 to 50 per cent as a result of effective drainage of steam heated machinery by the Morehead System.

We will gladly refer you to plants — similar to you own — where the Morehead System has speeded up production and cut down coal consumption. Many executives have told us that the Morehead System pays for itself ofen during the first few weeks' operation.

Morehead Manufacturing Co.,

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(25)

The "Morehead" Return Trap.

Positively Drains All Types of Steam Apparatus

Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature

Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"

When You're Up Against It for Oil

Of course, few oil buyers wait until their oil is all or nearly gone before they order more.

But once in a while you do get up against it where you MUST have prompt delivery.

In such instances you can rely on The Texas Company. The Texas Company has adequate facilities for speedy delivery in any quantity, to any purchaser, any time, anywhere.

We maintain District Offices at most prominent industrial and rail centers. Over 600 of the Company's stations for delivery of lubricants and other products are scattered throughout the country.

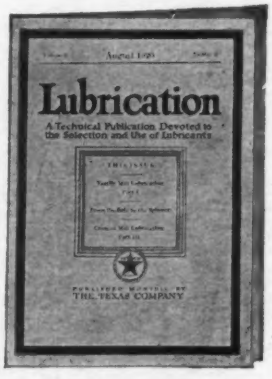
In addition to this, we maintain over 600 warehouses, hundreds of storage tanks, huge fleets of auto trucks, and over 5,000 tank cars.

Texaco Service means the right oil for the right place at the time you need it.

Within our delivery radius from all these stations, we can assure our customers against vexatious freight delays.

Whether you mail, wire or 'phone your orders, we execute them with a "zip."

There is a Texaco Lubricant for Every Purpose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PUBLISHED MONTHLY BY THE TEXAS COMPANY

In this magazine we print month after month, articles covering the problems of lubrication as applied to various industries. These articles are not theoretical, but based on practical operating experience.

It will be sent free to Engineers, Executives, Purchasing Agents, and all others interested in the use, selection, or purchase of lubricants for any purpose whatsoever.

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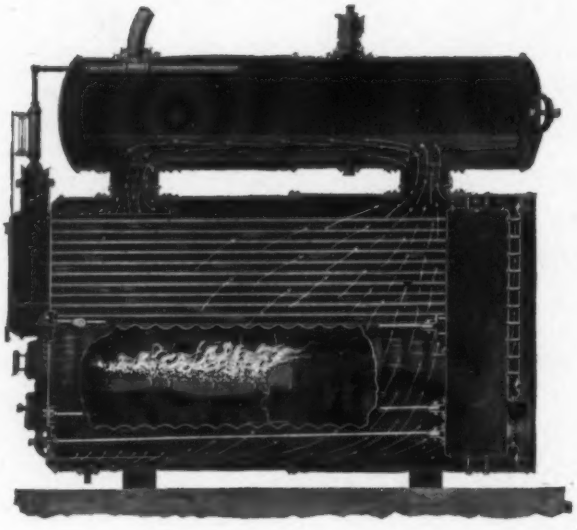
6-21

More Dry Steam With Less Fuel



HERE'S a perfect Scotch Boiler—a boiler that will generate more steam with less fuel.

Rapid, unrestricted circulation is absolutely necessary to the efficiency of any boiler, and while this feature is claimed for by many boiler manufacturers, the design of this boiler is such that it is positive at all times.

Large overload capacity, dry steam generated, and the remarkable flexibility of meeting fluctuating demands particularly adapts this boiler to severe conditions in industrial mills and plants.

Greatest economy is assured because of the circulating passage, which delivers water from the front neck to the bottom of the shell.

A constant temperature is assured because of this circulation which relieves uneven strains and stresses on this type of boilers.

There are no troublesome brick settings, as the boiler is self-contained and is ready for operation upon delivery.

Write today for detail information.

INTERNATIONAL ENGINEERING WORKS, Inc.
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Southern Representative,
Isaac Hardeman, Charlotte, N. C.

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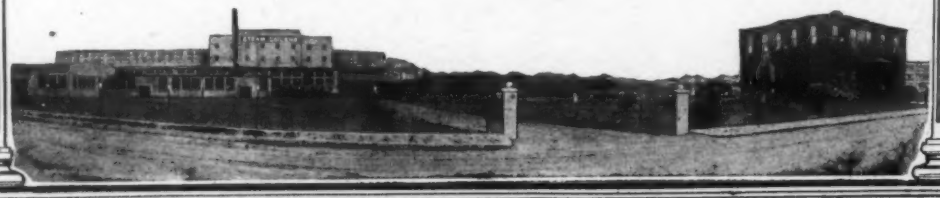

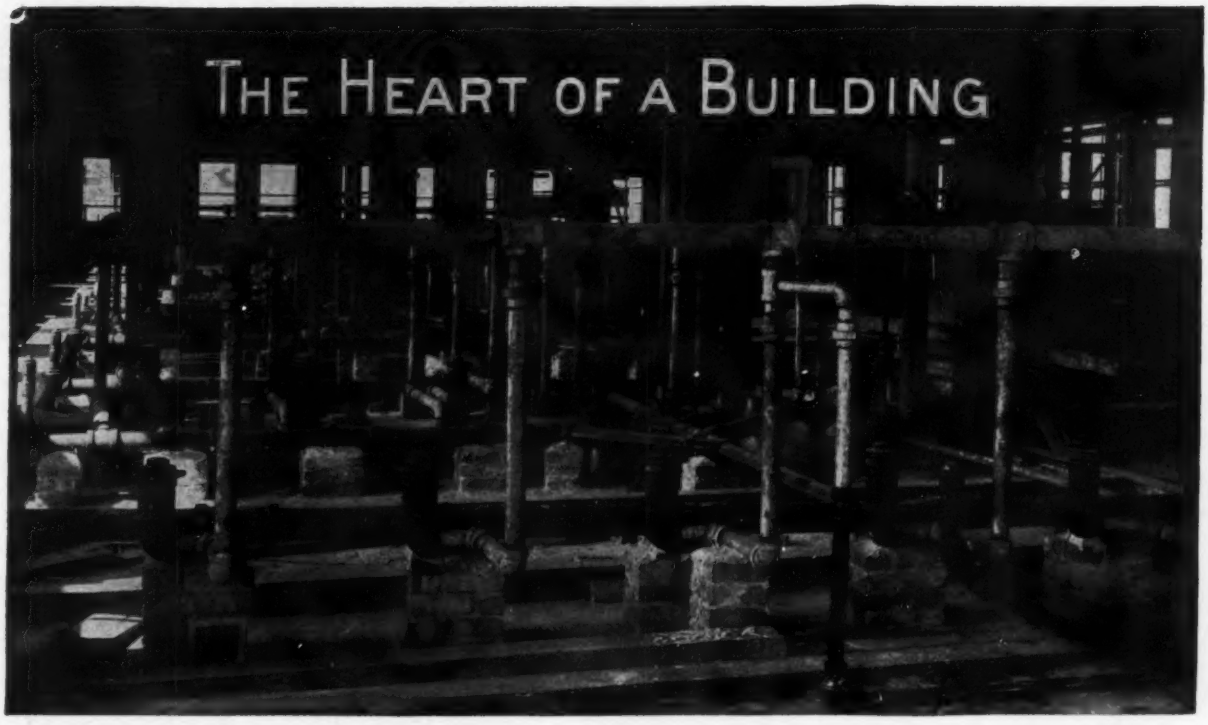

Defective or inferior equipment in the hidden piping systems between walls and floors, entails a needless waste of materials and unwarranted expense in the maintenance of the building. The established strength and durability of

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insures material that will withstand all necessary pressures and all subsequent operating strains without failure.

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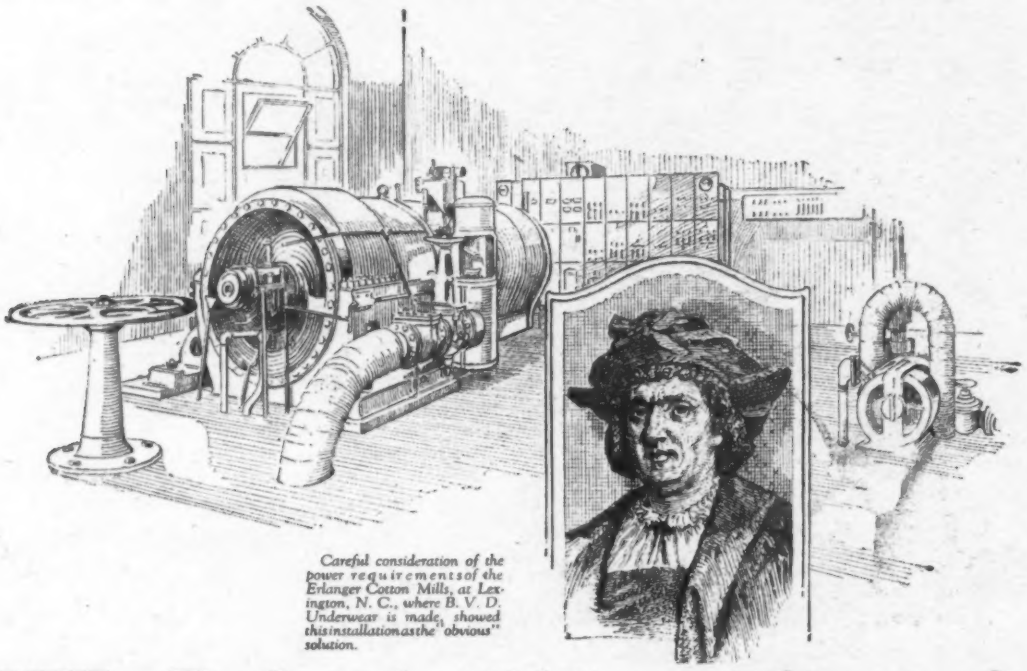
THE FUNCTIONS OF THE ENGINEER.



Careful consideration of the power requirements of the Erlanger Cotton Mills, at Lexington, N. C., where B. V. D. Underwear is made, showed this installation as the "obvious" solution.

VIII—Finding the "Obvious" Thing to do

When Columbus made the egg stand on end, he did what the others failed to do because they failed to see the "obvious" thing to do.

Since he believed the earth round, it was "obvious" to Columbus that he could reach the East by sailing West.

This "obvious" thing to do is often the most hidden and is reached only by a thorough analysis of conditions.

In production and distribution problems, the "obvious" solution is very often the most obscure and one for the Engineer to discover, because of his training in the analysis of situations and activities. As often as otherwise, the simplicity of his solution is as surprising as the savings he accomplishes by his recommendations.

A case in point is that of the Savannah Cotton Warehouse and Compress which was designed to handle and store baled cotton economically. No elaborate machinery was used. This method to accomplish the various steps was selected by the Engineer, after study, as obviously the most economical, and the results showed that cotton bales could be handled at from one-third to one-fifth of the cost in other cities.

A competent Engineering organization may be able to discover some obvious things to do for the sake of greater economy in your plant.

J. E. SIRRINE and COMPANY

Engineers

GREENVILLE
SOUTH CAROLINA

SERVICE

Farm Bureau Building
DALLAS, TEXAS

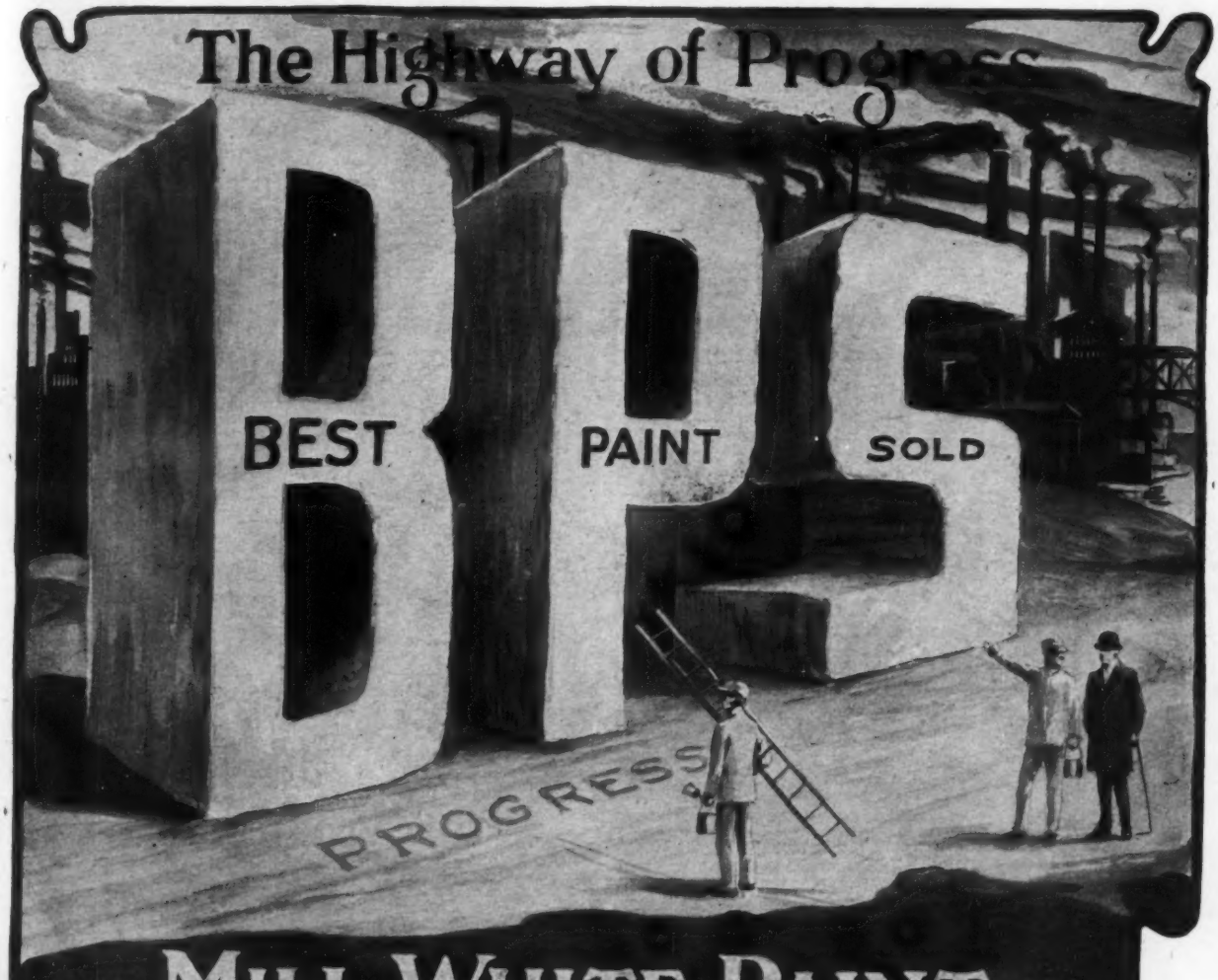
At least one of these booklets will interest you. Write us which one, then read it over carefully. It also may point to some of the obvious things to do.

"PICKS TO THE MINUTE"—a short treatise on textile plants, their design and operation.

"FACTORIES FOR THE FUTURE"—an application of foresight to the design and layout of industrial plants.

"COMFORT UNDER ROOF"—a review of some facts on the economical construction and results of industrial homes.

"RIVERS IN HARNESS"—a description of hydro-electric possibilities.



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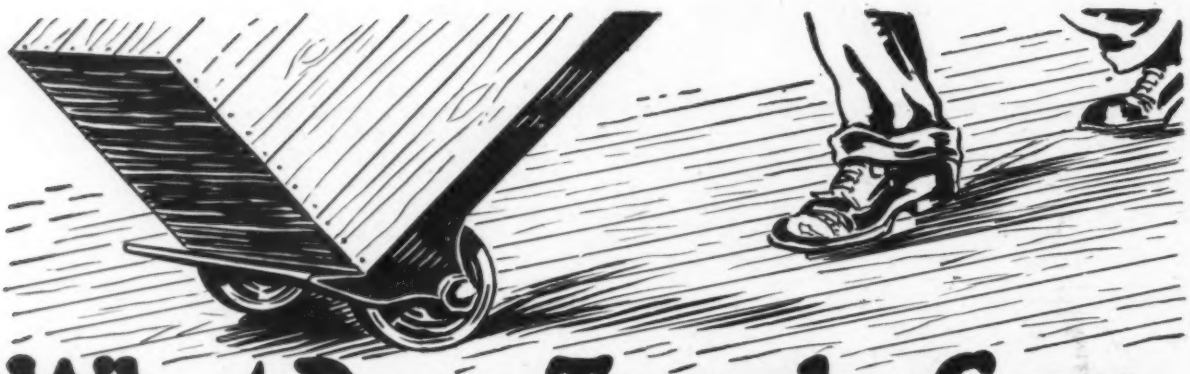

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for the hard knocks which heavy loads and heavy shoes impose on a "Tupelo" floor?

"'Nary a care!"

For "Heavy Going"

"a-wheel" or "a-foot," Tupelo floors in Textile Mills, Factories and Warehouses seem to actually grow solider and smoother as they grow older. Nature has supplied

TUPELO, the "Hard-Wear" Lumber

with a closely "knitted" or involved grain, which accounts for its non-slivering, non-splintering and long-wear characteristics.

For *all* the Tupelo facts—please write—*and you can't lay a floor quite* right *until you do.*

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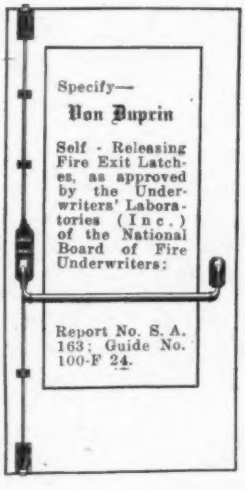
Von Duprin

Self-Releasing Fire Exit Latches

For Greater Safety


Specify—
Von Duprin
Self - Releasing Fire Exit Latches, as approved by the Underwriters' Laboratories (Inc.) of the National Board of Fire Underwriters:
Report No. S. A. 163; Guide No. 100-F 24.

Whenever human beings are grouped together in one building, whether it be a factory, a school house, a theater—or a skating rink, there is always the possibility of panic.

The mob spirit of fear comes without warning, and often when you least expect it. A smell of smoke, the jangle of a fire engine bell, a cry of "FIRE," caused perhaps only by an overtaxed nervous system—a touch of hysteria—and your crowd breaks for the exits.

What then?

If you have equipped the exit doors with Von Duprin Self-Releasing Fire Exit Latches there is little to fear; there is small possibility of loss of life or injury, for the mere touch of hand or body on the Von Duprin latches instantly releases the doors.

Von Duprin latches are sturdy, reliable, beautifully made and finished. No. Von Duprin, anywhere, has ever failed to operate in an emergency.

Let us send you Catalog 12-T, and the new booklet, "Saving Lives."

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Philadelphia Ice Palace,
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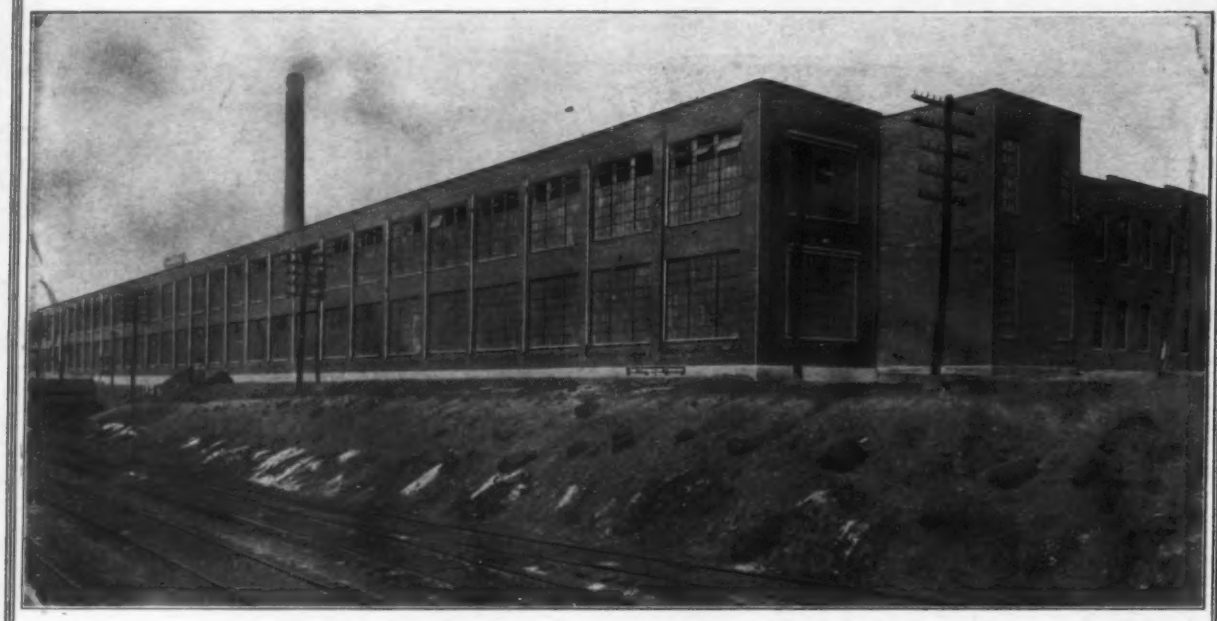
Philadelphia, Architects.



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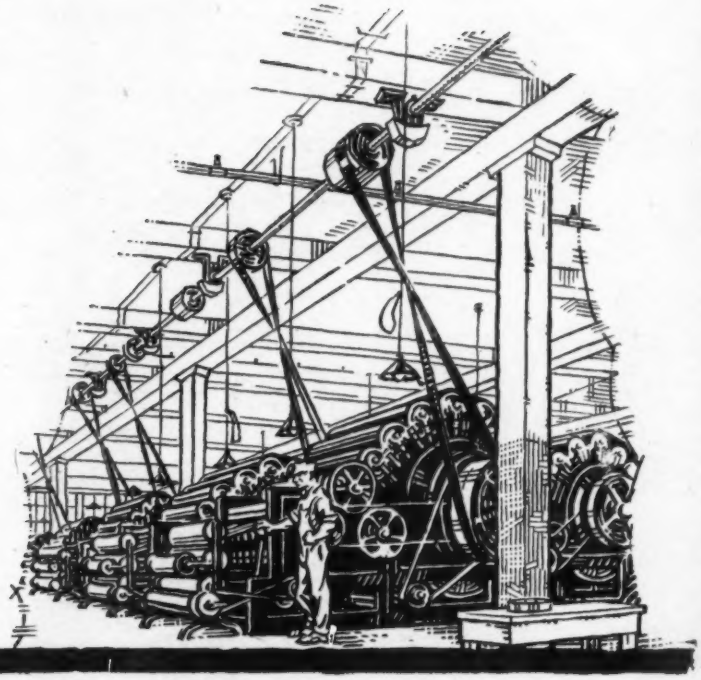

WASTE—waste—waste! Tons of wool lost each year in carding alone. Yards of finished product lost by this great source of shrinkage. Stop it! End it now!

Natural daylight will help. Take advantage of the generosity with which Nature furnishes all revealing light. Put this light to work at the simple cost of treating the walls and ceilings of the mill with OJACO Mill White. It makes the sunshine do double duty—it makes the sun an efficient instrument in production by reflecting its light, properly diffused and softened. The whole story is yours if you write, wire or phone an inquiry to

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Iron Clad Safety Line Switch

THE MK Series of Switch Condulets provides a cast iron housing for fused knife switches and is operated by an outside handle.

The door over the fuse compartment gives easy access to fuses. This door is interlocked with handle making the fuses accessible only when dead. The shape of the moving parts make this interlocking possible thus eliminating the use of springs, shootbolts, etc.

Detachable hub plates provide various conduit arrangements and facilitate electrical installations.

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1590

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These Condulets effectually meet all the requirements of "Safety First" principles.

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WATER POWER RIGHTS AND THEIR DEVELOPMENT

William B. Skelton, of Maine, former Public Utilities Commissioner, says:

"Many who are by no means Socialists advocate State ownership or control of the water powers on the assumption that the public is losing certain rights in the water powers. Their slogan is 'Let the State Keep Her Birthright.'

"Since away back before Maine became a State, the rights in the water powers have belonged to the owners of the shores. It is the same today. Nobody has parted with them, save as one individual has sold to another.

"The only purpose of the proposed legislation is for the State to acquire by Constitutional Amendment *something it never had, not* to prevent the loss of something it has. That is, the right to go into the water power business."

This is exactly the situation in Georgia.

Certain of the ill-informed are clamoring for property the State never owned, and talking about "rights" that never existed. They even assert that private enterprise is interested only in tying up water rights and is actually spending little or no money in their development.

WHAT ARE THE FACTS?

Private enterprise has spent in water power DEVELOPMENT in Georgia in the last 10 years, $25,000,000.

This Company alone has spent $20,000,000 in the same period.

And it will continue to spend just as long as Georgia offers a reasonable assurance of fair return on investment. Which means not only that present conditions must be favorable, but that there must be a reasonable certainty as to the future.

A Constitutional Amendment, allowing Public Ownership and opening the way to confiscation, would destroy such reasonable assurance.

Even the *threat* of such a move intimidates the investor. Witness the Tugaloo Development, where this Company having spent $1,000,000, has been compelled to suspend operations, awaiting the dawn of political peace and the investment of millions of new capital.

The Georgia Railway & Power Co.

Atlanta, Georgia

With the Publishers—

CAPTAIN GEORGE CECIL.

A Message from India

Government commercial agents have reported that India is a most fertile field for exports of American textiles. The country is a well known producer of raw cotton in certain grades. In India, even more than in China and Japan, the hand loom flourishes and the goods thus produced have been referred to in many historic accounts of civilization's early struggles. The cotton mills of India have been mentioned in many statistical articles, and it is well understood that in most of these mills, the managers and often their direct assistants, are importations from England or elsewhere. It has remained for Captain George Cecil to outline how these outlanders live, in addition to other interesting facts, in his article on another page of this number entitled, "Cotton Manufacturing in India."

Technical Discussion

When Gordon Cobb inaugurated the questionnaire system of securing material for technical discussion at the meetings of the Southern Textile Association he started something. It didn't go over so big at first, but it has gradually increased in size and momentum until it has reached a stage requiring a real organization to handle the work involved. This growth, as a result of only two years of effort, is because the men in the mills realize the value of such discussion in their daily work. It not only makes the man more valuable to the mill, but it broadens him out and prepares him for a larger and more responsible position. This has been particularly noticeable to us, because, during the years that COTTON has maintained a department for practical discussion, we have seen correspondents who participated therein promoted from overseers to superintendents and managers and in several cases to presidents of mill companies. And this was solely because of individual knowledge and initiative and not because of influential connections.

A man may have a good working knowledge of some technical subject and consider himself thoroughly advised thereon, but let him attempt to discuss this subject before several hundred men who also have a good working knowledge of the same subject and he will find it quite necessary to study out details beforehand, and at the conclusion of the discussion he will find many new ideas and suggestions have been placed before him for consideration. When such a man further exercises his ability by presenting these facts to COTTON'S readers, he is then covering a much wider territory and not only reaching mill men in his ownsection, but also mill men in all sections of this country and abroad. Such discussions are educational in the largest sense and any mill man who takes part in them intelligently, receives returns far in excess of the effort expended. The Southern Textile Association is building for itself a monument of service that will mean much to the industry if this educational work is continued to its logical and ultimate conclusion.

Made in Carolinas Exposition

John L. Dabbs, southern manager of the E. I. du Pont de Nemours & Company, is president of the Carolinas Exposition Company, election having been made at a meeting of the directors of the company held in Charlotte, N. C., on May 13. Other officers elected are: H. O. Miller and A. J. Draper, vice-presidents; Lane Etheredge, secretary; Phil McMahon, treasurer; A. G. Walton, executive secretary; Miss Margaret Holt, office secretary.

The directors have insured the exposition getting off to a good start by putting efficient men at the head of the enterprise during its organization and initial development period. These men are among the most efficient business men in Charlotte or the South. Mr. Draper is a cotton manufacturer and stands at the top of that industry in the country. Mr. Miller is president of the Carolina Baking Company. Mr. McMahon is engaged in the textile mill supply business. Mr. Etheredge is president of the Pyramid Motor Company. Mr. Walton is of Walton Advertising Agency.

The show will be held for two weeks, beginning September 12 and ending September 29. Construction of the building will begin at once and will be pushed to final completion. Two structures immediately adjoining and connecting will be erected this year. These will be permanent buildings. They will be of brick and steel, with reinforced concrete floor, and will contain 100,000 square feet of floor space.

The company has been fortunate in securing a desirable site for the building. The location is desirable from every standpoint. It is on a high hill overlooking the city, between the Hoskins car line and the Dowd road. Three hard surface roads lead to the site, making it easy of approach by automobile and truck. It is on the Piedmont and Northern Railway line, providing ample facilities for the handling of shipments to and from the exposition, a spur track already being placed. It is within easy access of the Mint street car line, with good sidewalks leading from the car line to the grounds. And it is only ten blocks, a matter of five minutes from Independence Square.

The exposition will feature any product manufactured in either North or South Carolina. Naturally these include an almost limitless number of commodities and the exhibit promises to be a most interesting display.

The Southern Textile Association, at its recent convention in Atlanta, voted to hold its Fall meeting in Charlotte coincident with this "Made in Carolinas" exposition because of the educational advantages it will offer to visitors.

AMONG COTTON'S READERS

GORDON A. JOHNSTONE, Agent
WINNSBORO MILLS
WINNSBORO, S. C.
President Southern Textile Association

"I consider COTTON one of the best textile magazines published, and it is a very ready guide when you are in search of something and do not know where to locate same or where same can be purchased."

Gordon A. Johnstone

June, Nineteen-Twenty-One

The Need for European Productivity.

Economics—not politics—rule the world. Even the dictates of humanity have less influence than the dictates of economic necessity. This may sound harsh and inhuman. But when President Harding directed the resumption of our participation in the Supreme Council, that we might have a direct voice in the stabilization of Europe, his action was dictated by the demands of a situation which threatened the economic life of the world.

In the end, economic life means human lives. Economic disaster means human deaths. During the war it was the economic aspects of the struggle that proved more potent than military strategy. Starvation was a more formidable factor than bullets. But when the thunder of the cannon had ceased, economic starvation continued. It was this that forced the hand of the President and it was the hope that our action might end this chaos which prompted the administration at Washington to undertake, by a direct participation, the leadership to an economic peace. Two years and a half of the type of peace which was created by the armistice and the treaty of Versailles demonstrated that it was almost as deadly as a continuation of the war. In fact, the conflict over the execution of the treaty had brought the world back to the verge of a new war, and only the intervention of the United States halted hostilities.

Few industries in the United States have had as vital a part in this economic phase as the cotton industry. Both as a producer as well as a manufacturer of cotton, the United States has felt the reaction of the breakdown of the world's economic frame work. Millions in Europe are naked because they can not buy American cotton goods. They can not buy them, because they can not find work with which to earn the money that is necessary to pay for them.

Millions of spindles in Europe are idle because they, too, can not find markets for their wares, in order that they might buy the cotton from the United States with which to resume the hum of pre-war activity.

What is true of cotton is true of a thousand other lines of production and consumption. The inter-change of commodities that was stopped by the war or diverted into channels of munitions has not been able to get back upon a real peace basis. Until it does, our growers must struggle with a lack of demand and our manufacturers must stop because their international markets have become poor.

It was this situation that prompted President Harding's cabinet to approve of a step which they feared might have disastrous political consequences. It carried with it all the perils of a new involvement in European strife. But it also carried with it the hope that by ending that strife, it might restore a proper balance between production and consumption throughout the world, and enable men to return to work so that their families might live and be clothed again.

For months, the steady slump in our exports has demonstrated the inability of Europe to purchase what it needs. Our banks have been over-loaded with foreign credits. Besides the $10,000,000,000 which the allied governments owe us as war loans and an additional $2,000,000,000 which they owe our private investors in bond issues, the world owes the producers of the United States something like $4,500,000,000 in unfunded short term credits. This vast sum represents the limit of America's credit capacity. It can not extend further credits until the old credits have been paid, at least in part. These credits can not be paid until there is a stabilization of European production, until there is a resumption of peace which will enable her factories to reopen and her workers to go to work.

If the conflict over the question of reparations developed a new war all hope for such a settlement would be ended. For a new war in Europe would mean a final chaos. There might be a brief demand for war materials from such of the nations as could still pay for them—but that fever would be short.

On the other hand, if Europe could be led to a peaceful settlement so that Europe could go to work, there would be a quick re-adjustment of international credits. For instance, a settlement of the German reparations on a basis which would make the German bonds issued in payment actual marketable securities would enable the powers that received them to use them in the payment of their debts to us, as well as for the basis of new credits.

The fundamental difficulty with the European situation has been the fact that the United States had sold to Europe the full limit of its credit facilities. The United States has been in the same position that a cotton manufacturer would be if he had sold to all his customers, on credit, as much of goods as his own capital would allow plus all the credits which his bankers would extend to him. When he reached that point, he would have to stop business unless he could collect from his customers. If these customers, instead of paying for their wares, developed a decided tendency toward bankruptcy, he soon would be bankrupt, too.

That has been the position of the United States. Instead of paying the huge debts which they owe us, both governmentally and privately, European countries developed a steady tendency to greater deficits with an ever-increasing likelihood that they would not be able to pay their debts at all. If, therefore, the action of our administration in participating in the council at London and at Paris could check this tendency to war, to bankruptcy, and to chaos, and could substitute for it a sane and workable program which would make possible not only the stabilization of Europe but the stabilization of our whole industry and of our foreign trade, it would be the first great forward step toward a new nation-wide prosperity.

The statistics of our foreign trade present a dramatic picture of the effect which the failure to stabilize Europe's economic affairs has had upon American industry and commerce. In March, 1920, the foreign commerce of the United States reached the highest point in the history of the nation. In that one month our foreign business aggregated the amazing total of $1,343,479,273. The exports in that month were $819,556,037; the imports, $523,923,236. In September, 1920, our foreign commerce totaled $1,084,407,128, made up of $751,211,370 of exports and $333,195,758 of imports. They never touched the billion dollar mark again. In January, 1921, our exports had dropped to $654,740,158 and the imports to $208,796,980, a total of $863,537,147. In February the export figures were $489,297,067 and the imports $214,529,680, a total of $803,826,747. In March exports had dropped to $386,811,138 and imports to $251,988,741, a total of $638,799,879 or less than half of the total recorded in the high-water mark of the same month a year ago.

How It Happened.

Of laws and lawmakers there is no end. While there now seems to be some danger of a scarcity of medical men, especially in the smaller communities and in the country districts, because of their zeal in protecting humanity from the ravages of disease and thus reducing the number of prospective patients, the number of lawyers is found to increase as their efforts are largely directed along political and legislative lines, resulting in cumulative laws, many of them so worded that it is sometimes impossible for even an experienced attorney to solve their exact meaning.

One example that immediately comes to the mind of a business man is our present clear and lucid income tax law. Of course this is a federal act passed by the national Congress and as such it is an adaption of many suggestions from many sections. It is generally conceded that the finished product shows its ancestry. In the short time it has been in force it has proven a valuable vein of "pay ore" for the lawyers and they are working at it assiduously.

State legislators are also seeking fertile fields wherein their brethren can garner crops of coin, and at the same time allow such legislators to point with pride to acts passed for the common people, thus tending to perpetuate individual terms of office. Such a bill was introduced before the South Carolina legislature not long ago and the fact that it failed of passage showed poor organizing ability on the part of its backers, as it had all the earmarks of a lucrative proposition. This act was to regulate the temperature in the State of South Carolina, particularly in the cotton mills. By the terms of the act it became the duty of the State Board of Health "to examine into each and every factory or textile manufacturing establishment" and determine the "thermal limits of temperature."

Section 2 of this act placed the temperature limitations to be enforced entirely in the judgment of the State Board, while Section 3 ordered the factory managers to "procure and place in an appropriate place in each room of the said factory or textile establishment a well regulated thermometer." Salesmen representing "well regulated" thermometers would have hailed the passage of this bill with joy, and undoubtedly members of the legal fraternity would also have been enabled to discuss learnedly upon the proper number of thermal units it would be allowable to have loose at any one time in any single factory. This would have meant an increased sale of books on thermotics.

Massachusetts is also afflicted with legislators. For that matter so are all states, but Massachusetts is merely mentioned as an example. In Massachusetts the legislators do not attempt to worry about little things like thermal units. They go in for higher mathematics. Section 116, Chapter 198, of the General Acts of 1919 of that State requires the posting, in places accessible to the operatives, of a detailed schedule of the method used in the computation of prices paid for weaving. It seems that up to this time State officials have not insisted upon the enforcement of this law because no one knew exactly how it could be done. At last a cotton mill man with a penchant for mathematics and a slide rule has devised a method for complying with this law. Upon another page this method is described.

These incidents bring to mind a story that was told of a visitor from abroad, who, having his attention drawn to the idiosyncrasies of some of our public men, asked his host how men of this type managed to get into office. That is easily explained, responded his host. Many years ago the king of a nation of that period was very fond of hunting, but was unfortunate in always selecting days for his sport that were marred by sudden showers. He consulted the royal weather prophet regularly, but usually with disastrous results.

One day he chanced upon a peasant astride a jackass on his way to the market place, and on asking his opinion on the weather, received a correct prediction. Recalling this experience, he later sent for the peasant and received further correct predictions. Greatly pleased at the success of his new prophet, he dismissed the unhappy incumbent and bestowed the robes of office upon the peasant.

Then a peculiar thing happened. The peasant could no longer correctly predict the weather. After several unsuccessful prophecies, the king took him to task for his failures, whereupon the peasant replied as follows:

"Be it known, oh master, that since I have donned the robes of office I no longer have my natural barometer with me. It is a well known fact that a jackass will hold his ears erect on a pleasant day and allow them to droop when rain is imminent. Not having my jackass my predictions fail."

Thereupon the king arose in a rage and casting the peasant out from office, ordered that the jackass be clothed in the robes of authority and be known thereafter as the official weather prophet.

And, concluded the narrator of the story, we have had some jackasses in office ever since.

Cotton Manufacturing in India

BY GEORGE CECIL.

When one remembers that in the year 1854 the first mill for the manufacture of cloth and cotton yarn by steam-worked machinery was opened in Bombay, the fact that about 150 similar mills now exist is a matter for surprise. The word "surprise" is used, since India is not precisely a country of progress—commercially or otherwise. Natives and Anglo-Indians alike appear to be content with methods which served their ancestors. However, the growth and development of the cotton industry is a matter for congratulation. In 1880 there were fifty-eight such mills, the number of spindles in use being about 1,500,000, and the number of looms 12,000, some 50,000 natives being employed. As at the present time, Bombay claimed the majority of mills, though Guzerat could boast of a dozen or so; while Calcutta possessed but half that number. Madras, Cawnpore, Nagpore, Hyderabad, and Indore each possessed one or two mills.

But long before the year 1854, cotton-weaving was an important Oriental industry. Nearly three hundred years ago we are told that cotton goods were imported from India. As far back as 1641 "Manchester cottons" were, so it is said, in reality a copy of the Indian calicoes of the period. Still, if the Indian Empire was first in the field in the hand-manufacture of cotton goods, it was lamentably slow and grievously backward in the adoption of steam power.

Early Products.

A word as to India's early cotton products. From time immemorial the local demands have been satisfied, and the American war between the States gave an enormous impetus to the export trade. Before that period, raw cotton shipments from India averaged some three millions sterling a year: while in 1866 thirty-seven millions was the total recorded. Later, they fell considerably, the fall being caused by the restoration of peace in America.

It is interesting to note that improved cultivation has not been applied to the Indian cotton plant, since the short staple which prevents its being used for spinning the finer qualities of yarn is as prominent now as it was sixty years ago. The districts in which cotton is grown are many and varied. Katiavar and Guzerat in Western India, as well as Berar, the Deccan, and Central India, are the principal feeders of the Bombay Presidency and its adjacent mills. In the Dharwar district experiments have been made with New Orleans cotton seed, and success has attended the innovation, though elsewhere it has failed.

A few statistics in connection with the area under cotton cultivation in the year 1875 (the period at which such vast strides were made in the industry) may be of interest. Thus the total area under cotton in the Bombay Presidency and adjoining states and districts amounted to 4,516,587 acres, and the yield in cwts. was 2,142,835. Of the foregoing total 583,854 acres were sown with imported seed, the yield being 248,764 cwts. The average yield was 53 pounds of cleaned cotton per acre. Some information as to the total exports of that period may also prove instructive:

Year	Cwts.	Value
1875-76.....	3,887,808	£10,673,761

In 1877-78 cotton cultivation in the Central Provinces was greatly extended, the yield being 59 pounds per acre. Its exports to the Bombay mills reached, at that period, some 300,000 cwts., the value amounting to £672,000. Berar in 1879 possessed a cultivated area of 2,078,272 acres—being 32 per cent of the whole area under cultivation; the average yield of cleaned cotton equalled 72 pounds per acre. In the Madras Presidency—"benighted Madras" as it is called—the area under cotton in 1880 was some 1,500,000 acres, while in Bengal it was somewhat less.

The present aspect of Indian cotton cultivation probably is well known to readers of COTTON. In spite, however, of the extraordinary gain in the number of steam-driven mills since the advent of the solitary example erected in 1854, handloom weaving is common all over India, many of the simple villagers preferring cotton goods thus manufactured. The output is not colossal; nor is it likely to increase; and it certainly does not enter into damaging competition with the mill-made article.

Native Capitalists.

As in civilized countries, the cotton manufacturing companies are joint-stock enterprises, and of a limited liability nature, the shares being largely taken up by English, Anglo-Indian, Hindu and Parsee capitalists. The officials of the mills are skilled men, assisted by native and Parsee under-strappers. They usually sign an agreement to serve for from three to five years, and they receive a fair remuneration. Eventually their places in native mills will, in all probability, be taken by Parsees and Hindus, since the latter, by dint of close study, are rapidly becoming efficient. As to the Parsee, he is a man of brains; he is the nearest approach to the white man in what is, after cleanliness, the most desirable of all attributes. It should be added that a heated journal or a broken belt causes the Hindu engineer to wring his hands and to shed bitter tears. The Parsee man of machinery, on the other hand, applies himself to the task of averting such a catastrophe as the closing down of the mill.

The native operatives are paid at a considerably lower rate than that prevailing in England, France, Russia, Italy and America. And this can be well understood, since the Hindu workman is able to exist comfortably on three or four rupees a month. Roughly speaking, the following table will give their wages:

	Wages	Hours
Men .....R.	9 per mensem	6 a.m. till 6 p.m.
Women	8 " "	less one hour at
Children	6 " "	midday.

As elsewhere, machinery and engines of the latest and most improved type often are in vogue, though in more than one cotton mill the old-fashioned beam-engine is to be found—frequently performing excellent service. The carding and combing machines, drawing-frames and spindles, however, are usually of desirably modern make and construction.

Roughly speaking, the Indian cotton mills are distributed as shown in the table, but owing to the fact that native mills are occasionally swept off the face of Hindostan by fires, the number varies:

District	No. of Mills
Calcutta (and suburbs)	9
Chittagong	1
Berar	2
Bombay (and suburbs)	70
Bombay Presidency	27
Central India	2
Central Provinces	6
Madras (and suburbs)	4
Madras Presidency	16
N. W. Provinces	7
Punjaub	3
Rajputana	1

Many of these mills possess exceedingly "fancy" names, such as the Mahaboob Shahi Galberg Mills Co., the Venishunker Luxishunker Cotton Mill Co., the Albert Edward Mills, the Madhowji Dharamsi Manufacturing Co., the Juirap Bullo Spinning and Weaving Co., the Damodhar Lakhindas Mills Co., and the Jam Manufacturing Mills Co.

The Relaxation of the European Employee.

It is difficult to say who dislikes his exile the most—the European manager or his subordinates. The former would, in a small "station," probably be admitted to the society of the half dozen Europeans who are to be found there; but the employees might not be accorded the privilege. And they probably would not care to associate with the half-caste element. The staff of an "up-country" mill is thus left to amuse themselves in each other's company, while the manager foregathers with the officials who make up the local *elite*. In Calcutta, the staff of the various jute and cotton mills which adorn the banks of the river Hoogley are eligible for membership of the two or three clubs which exist for their benefit. At Bombay there is a "Textile Club" to which the Europeans connected with the various cotton mills belong. But from time to time interior strife causes the club to close for a period. During these intervals the Volunteer Club of that city reaps a harvest—in the shape of additional members. The fourteen or so cotton mills at Ahmedabad provide the local "Mill Assistants' club" with some thirty or more members. But here also smooth sailing is not the rule; for fear of meeting one another each belligerent resigns his membership of the club. In Lucknow there is a commercial club to which the local paper-mill employees belong, and the Volunteer Clubs at Lahore, Agra, Cawnpore and elsewhere welcome the representatives of the local jute and flour mill industries.

Although lawn tennis, badminton, dominoes, whist and political conversation are obtainable at these clubs, the interiors are not lavishly decorated and furnished, nor are they particularly comfortable. Often the barest necessities in the shape of tables and chairs are provided, though a billiard table is usually *en evidence*. The latter not infrequently is of a second-hand and fly-blown description, possessing pockets which do not encourage the "potting of the red," and the "slowness" of such tables is proverbial. Indeed, but little pleasure is to be derived from endeavoring to play on them: they are a trial to the performer's temper, and an incessant source of annoyance to the skilled player. The wives and children of the exiled community are also admitted to the clubs, where occasional dances and concerts are given. At these entertainments the performance—both vocal and instrumental—is of an amateur description, the residents providing the talent. Masonic meetings and banquets also take place in the local Textile Club. The craft, it may be mentioned, extends its fostering care to the majority of mill operatives who make India their temporary home.

During the day such clubs are not patronized by the members, who are busy with their multifarious mill duties. But from six o'clock in the evening until some three hours later they are the scene of jest and merriment.

A New Commercial Map of Asia.

A travel, market and shipping guide covering the countries of the Far East and furnishing a graphic summary of their natural resources and trade possibilities, is provided in a new commercial map of that region published by the Irving National Bank, for the information of merchants and manufacturers engaged in trade with the Orient or contemplating entry into that field.

The map includes not only all the countries of eastern Asia, but also the islands of Japan, the Philippines and the Dutch East Indies. All important harbors and ports are shown, together with the principal steamship routes, their distances in miles and the number of days required to cover them. Railways, including both the roads now in operation and those being built or proposed for future construction, are set down, as are canals and navigable rivers which can be used for commercial purposes. Cities in which the United States maintains consular offices and agencies are noted by special symbols, and cable and wireless facilities are also indicated.

Five smaller insert maps show the varied nature of the vegetation, the density of population, the principal products and the rainfall in the months of January and July, the months of seasonal extremes. In addition, the principal map shows the nature of the chief mineral, timber, agricultural and other resources which are to be found in the several countries.

William Rider & Son, Limited, publishers, 8 Paternoster Row, London, have begun the publication of a series of technical handbooks on the raw materials of industry, and the first work of this series is entitled "Cotton and Wool." Full information is given in this volume as to the source of the present supplies of both cotton and wool, the processes used in manufacture, etc., past and present prices of cotton, and other information of interest, including the various uses of these two commodities. The author is J. S. M. Ward, B. A., F. S. S., F. R. Econ. S., head of the intelligence department of the Federation of British Industries.

The tenth edition of a technical and practical treatise on "The Construction of the Power-Loom and the Art of Weaving," by Alexander Brown, is now ready for distribution by the publishers, James P. Mathew & Co., 11 Cowgate, Dundee, Scotland. This book is intended as a text book for those who are engaged in the actual operation of weaving and deals with the mechanical features thereof. The present edition has been carefully revised and brought up-to-date by Thomas Woodhouse, teacher of textile design and manufactures in the Dundee Technical College, who has in recent years contributed several series of technical articles on cotton fabric design, etc., to the columns of COTTON. The book is illustrated with diagrams and has 162 pages.

Southern Textile Association

Members of the Southern Textile Association were the guests and Atlanta was the host—this was the gathering of the Association for their 25th semi-annual convention which was held in the Gate City of the South on Friday, the 13th, and Saturday, the 14th, of May.

The convention started with the first session on Friday morning at 9:30 o'clock, and continued through the final session, which was held on Saturday morning, and between these sessions there was a full measure of entertainment, and helpful and instructive reports and discussions.

The First Session

was brought to order at 9:30 o'clock on Friday morning in the convention hall of the Piedmont Hotel, by Frank G. North, the chairman of the Atlanta entertainment committee. Rev. Richard Orme Flinn rendered the invocation. Mr. North called upon W. R. C. (Dick) Smith, governor eighth district Rotary, and president of the W. R. C. Smith Publishing Company, who delivered the address of welcome to the visitors. Mr. Smith said in part:

"We here in Atlanta boast with great pride of our far flung enterprise, of our industrial activities and of the spirit which has made us great. But we oftentimes forget that much of this greatness has been achieved by reason of the fertile fields and the industrious endeavor of many men like yourselves who, scattered over the valleys of the Piedmont and the rich coastal plains of the South Atlantic and the Gulf, have, after all, in the last analysis, made all these things in Atlanta a possibility and a reality, and I deem it only fitting this morning to pay you that honest tribute which you deserve and to acknowledge in some small measure, if I may, the great debt which we owe you.

"As a servant of a great international organization, of which I am proud to be a member and whose motto is 'He profits most, who serves best,' a slogan which is slowly becoming recognized by thinking, conscientious men today as a practicable, workable regulation of everyday business life, I take particular pleasure in welcoming you to this city, for I feel indeed that you are master craftsmen yourselves, of all that slogan I have quoted implies, for you also hold that the exchange of your goods, your service and your ideas for profit is legitimate and ethical provided that all parties in that exchange are benefited thereby. You hold that it is your aim to elevate the standards of your vocation and to so conduct your affairs that others in your vocation may find it wise, profitable and conducive to success and happiness to emulate your example."

Taking up the subject of service, and the work the Association is promoting through its sectional committees, Mr. Smith continued:

"Service is the moral responsibility of business, and by business I mean the men who finance and factories and the men who operate them through all kinds of stable and unstable market conditions. You men of the Southern Textile Association are the chiefs of the operating division in your line of work. You are the active heads of the mill or its departments and you well understand the service ideals necessary to secure the best results for the men who finance your plants. You are here to discuss these methods, and I understand that you hold several meetings a year in sectional form to further elaborate upon them. You are also entirely familiar with the ideals of service now held toward those who work under you.

"But there is still another brand of service that rests as a moral obligation on every citizen of this country, and particularly those who control, to a greater or lesser extent, the production of any of the basic necessities of our existence, and that is our service to humanity at large.

"In these modern times," declared Mr. Smith, "we have passed the point where any man or even any nation is self-sufficient, and we are all dependent upon others for many of the necessities and luxuries of life. However, when those others demand shorter hours at increased pay, of necessity their production decreases and the price of their product increases, frequently causing hardship and suffering among us although apparently we are in no way affiliated with their particular trade or business. You can-

PRESIDENT H. H. BOYD.

not ride on a railroad train today without being reminded of this fact. It is also in evidence when you take your basket to market for the food you eat. Wherever you go, whatever you purchase, you are always reminded that in the transportation service of our country are men who are not delivering 100 per cent of service.

"But it's not simply a question of wages or hours or of any one industry; this question of service to society means a service that will eliminate waste in industry.

"Many of you may not be familiar with the fact, but surveys are being made at Washington by some well known engineering societies covering some eight or nine of the basic industries of the country. These surveys are being made to detect and point out wastes in industry. They are not yet entirely completed, but in textiles, for example, the percentage of efficient operation is only 35 per cent, due mainly to strikes, business slumps, or other generic conditions. Whatever you can do to increase the percentage of efficient operation in your plants is going to boost the textile percentage nearer the 100 per cent or perfect mark, and as you all well understand, the nearer you approach 100 per cent in efficient operation, the lower will become the unit cost of your product to society.

"If you are operating an up-to-date mill on full time

with no labor troubles, you may think that it is hardly fair to burden you with the shortcomings of some other person," continued the speaker. "However, as in baseball, team work is necessary to secure the best results and all members of any basic industry like textiles must work together if they hope to increase the percentage of efficient operation within the industry. It means that every man must play the game hard, and playing the game means hitting the ball, not the umpire. There's a vast difference.

"Before I leave this subject of service in waste elimination, I wish to call your attention to something that is being done along that line by Secretary of Commerce Herbert Hoover. He is so reorganizing the work of the Bureau of Standards and other sections of the Department of Commerce that they will be in a much better position to render you aid and advice than has been the case in the past. In order to further this work he has asked Congress for a deficiency appropriation of $680,000. It is important to you as manufacturers that his work along these lines be continued. You can help in this matter by writing your congressman immediately upon your return home, and urging his support for this appropriation. I sincerely hope you will act promptly in this matter."

Following Mr. Smith's remarks, Chairman North presented to the assemblage the president of the Association, Harry H. Boyd, of Charlotte, N. C., who called upon John W. Clark, of West Durham, N. C., to respond to the welcome address.

Mr. Clark very graciously expressed the thanks of the Association for the welcome tendered them, paying a high tribute to the southern section, and stating that the men who compose the Southern Textile Association have a supreme confidence in the future of the cotton mill in the cotton field.

"This association is a great educational organization," said Mr. Clark, referring to the Southern Textile Association, "and the men who gather in its meetings are leaders in the practical operation of our southern factories today. These men come together to exchange experiences and gain new ideas. I dare not attempt to prophesy as to the changes that are likely to take place in the textile industry in the days to come, we all know that improvements are constantly being made and that in its development the industry is merely on its way. Carried to its last analysis there can only be one best way of performing any one operation. To aid in determining these best ways and to assist in the development of the industry as a whole the Southern Textile Association was organized. It has done a great work in stimulating thought in the past. The future it looks forward to with confidence."

President's Address.

When Mr. Clark had concluded, President Boyd read the annual address of the president, saying in part:

"The past few years have been trying times for all the people of the world and the southern textile industry has had its full share of troubles. When our boys were returning from the World War, there came a great demand for textiles and when we tried to meet that demand and as everybody tried to get a part of the profits, we did all kinds of things to attract labor to our mills so that we might keep the wheels of production going.

"The result was continuously increasing costs and increasing prices, as in every other business until the public finally refused to pay the advanced prices and entered upon a buyers' strike that caused a collapse of high prices.

"The decline in the prices that can be secured by the cotton mills for their products has been abnormal and in order to meet present conditions the mills have been forced to make substantial reductions in wages. Fortunately the operatives have realized these changes in conditions and have almost without exception accepted the reductions without complaint.

"We regret to state, however, that all has not been harmony during the past few years. We do not seem to have the men and women, boys and girls whistling and singing at their work as they once did, nor competing to do more or better work. There is evidently something wrong, for the pleasure seems to have been taken out of work.

"I have nothing to say against welfare work, in fact, I commend it, but it does not seem to have produced the harmony and cooperation that we expected.

"We have the best equipped cotton mills in the world. We have the cotton and the climate and the great advantage of an English speaking race. There is no reason why we cannot advance to the place where it is possible to manufacture the finest textures that it is possible to produce from cotton.

"One of the greatest factors in our progress toward that end will be the Southern Textile Association, which was organized among the superintendents, overseers and master mechanics twelve years ago.

"The Association has done good work since its organization by bringing the practical men of the mills in contact with each other and enabling them not only to become acquainted, but to increase their knowledge of textile matters by hearing addresses and discussing problems among themselves. I feel, however, that the Southern Textile Association did not find its real field of usefulness until F. Gordon Cobb conceived his questionnaire system which he was able to perfect during his term as president. This questionnaire system gathered together the ideas of the best practical men of our industry and the educational movement that it started has given us a vision of the future.

"It was my good fortune to follow Mr. Cobb as president of your Association and it was the logical result of the questionnaire that the men should gather to discuss the differences of opinion that had been made evident from the answers received.

"Last December we held a meeting at Charlotte of the carders' division of the Association and that meeting was so successful from every standpoint that we followed it with a meeting of the spinners' division at Spartanburg in January and the weavers' division at Greenville in February. Each of these meetings was attended by approximately 175 members and exceedingly interesting and instructive discussions were held both in the morning and afternoon sessions.

"One result of these sectional meetings has been that many of the men returned to their mills and began to make tests to determine the correctness of the various ideas advanced. If I correctly catch the vision of the future our next step will be to prepare standard forms or methods of making the various tests and to compile the results of these for the benefit of the entire industry."

Mr. Boyd then spoke of the proposed Textile Foundation and the good it is expected will be derived therefrom, and in conclusion thanked the chairmen of the several sec-

tional committees, and the textile press for the splendid support and encouragement given him during his term as president.

Report of Carding Committee.

The Association then entered into the practical side of their purpose, and the president called upon Marshall Dilling, superintendent of the A. M. Smyre Mfg. Co., Gastonia, N. C., and chairman of the Association's sectional committee on carding, to render the report of that committee.

Mr. Dilling prefaced the reading of his report by a few remarks, stating that the conclusions which would be presented therein were the results obtained from the questionnaires sent out and of opinions expressed at the meeting of carders in Charlotte on December 10. He further impressed upon the mill men present the necessity and value of their cooperating with the different sectional chairmen in the working out of better methods of manufacturing, etc. As an evidence of the manner in which the value of the sectional work being done by the Association is being realized and appreciated by southern mills, Mr. Dilling declared that since the inauguration of the present plan, he had had requests from many mills scattered over the entire section for assistance and advice on certain points. Not because of his personal ability or anything like that, declared the speaker, but because the mills realized the value of the work being carried out along the different lines by the Association, and in that work he requested the cooperation of every mill man member of the organization.

Mr. Dilling's prepared report consisted of a resume of the work accomplished at the Charlotte meeting of carders, and summed up the gist of opinions expressed at that meeting on different points pertaining to picking and carding.

Referring to the Charlotte meeting, Mr. Dilling said:

"Many subjects pertaining to the carding department were discussed, but the two questions that appeared to hold the most interest were those pertaining to picking and drawing. The discussion on picking centered around the merits of the two or three process systems. Some claim that with three processes they can get evener and cleaner work and for that reason it is better to have breaker, intermediate and finisher. On the other hand, many who have tried the two process system believe they can get a stronger yarn and the quality from every other standpoint is just as good and they are loud in their praise of the merits of two processes. From the answers received from the questionnaire and the discussion at the Charlotte meeting, it is my opinion that the two process system can be made as efficient as the three, but to do this it is necessary to have:

"First, an efficient opening system, that is, one that will open the cotton and restore it to its natural condition. To accomplish this the cotton must be opened and aired thoroughly, and I know of no better way than to run it through a condenser, C. O. B. machine or any other machine that will open and carry the cotton through by suction or forced draft.

"Second, running the beaters at a speed that is just enough to clean the cotton and not enough to injure it by striking or beating it harder than the delicate nature of the fibers will stand. Around 1,000 r. p. m. is recommended.

"Third, feeding slow and light enough to allow all the cotton to be cleaned instead of rushing it through so rapidly that only a part of the cotton is cleaned and that part only partly cleaned.

"Fourth, have the rolls and grid bars set and adjusted to the stock being run.

"Fifth, the eveners and regulators must be kept in good working order to do their work properly.

"The advantages to be gained are less working of stock, economy of operation and saving in power.

"The discussion on drawing was as to the merits of one, two or three processes, and about the same arguments were advanced in favor of one process of drawing as to two processes of pickers. Many combed and some carded goods mills are getting excellent results with one process while others claim they cannot get as even work with one as with two processes as they have fewer doublings. The combed goods mills can get the doublings on the lap machines and combers but a carded mill must be able to keep their stock uniform, their numbers and weights even, and the preceding machinery and equipment in a very high state of efficiency to be able to run successfully with one process of drawing."

At the completion of the presentation of this report, the meeting was thrown open to discussion on carding subjects, and Gordon A. Johnstone, agent, Winnsboro (S. C.) Mills, asked Mr. Dilling if in his reference to picking, did he consider the beater process as a process or a machine with two beaters in it as a process, and whether in drawing he referred to this as one process, or three processes because of the doublings.

Mr. Dilling replied that in his opinion, the machine containing two beaters would be only one process of picking. "Of course," he added, "if you have two rigid beaters, that would be very close to two processes."

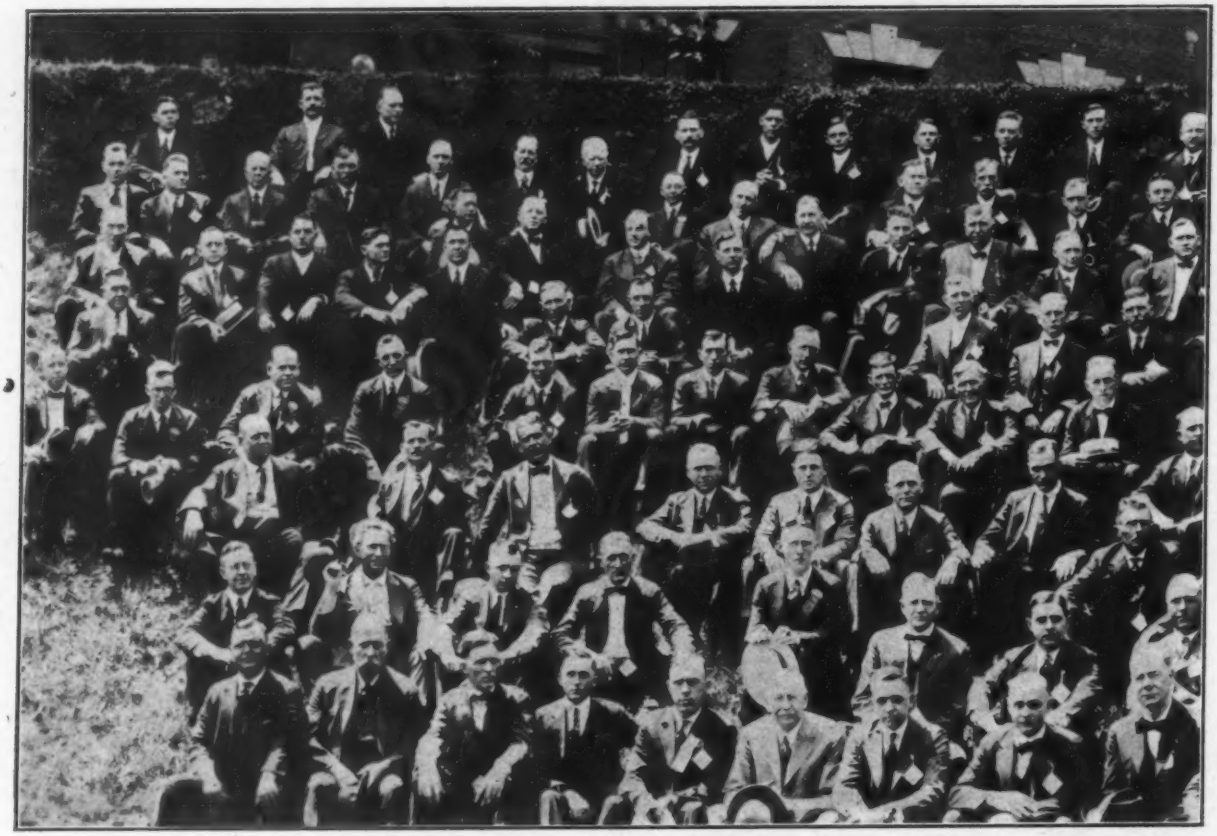
W. R. Campbell asked the chairman, in regard to his recommendation of 1,000 r. p. m. speed for the beaters, how many beats per inch that is supposed to give the fibers.

"It depends upon the stock," answered Mr. Dilling. "Clean stock gets very few beats. This is a matter that will be decided by each individual mill. He referred the questioner to the paragraph in the report just presented, which recommended: "running the beaters at a speed that is just enough to clean the cotton and not enough to injure it by striking or beating it harder than the delicate nature of the fibers will stand."

"We have been making some tests," continued Mr. Campbell, "and on some of the stock we were beating 32 to the inch, while on others we were giving only 12 beats to the inch. This latter was on 30s and we found that the breaking strength of the yarn was 10 pounds under standard." He said that his beater speed was 1,200 r. p. m. in both instances, and was on a Kitson, rigid, two-blade beater. He added that he is also making tests on the carding beater.

"You can beat ten times to the inch and you can have the speed so high that you will injure the stock," said Mr. Dilling, "and you can have the speed so low that you will not get the right results. It is not every time the number of beats, but the force with which it strikes the cotton."

Ralph Webber, of Clover, S. C., said they had been making tire yarns—20s single—on a guaranteed breaking strength of 215 pounds, and had been making these for three or four years with two processes of picking—one opener and a two-blade beater on the finisher. A later installation of machinery gave them two beaters on the breaker and also a beater in the finisher. When the stock was run through this system, he said, the breaking strength dropped, and then he told the men to put it back through



A GROUP OF DELEGATES AT GEORGIA TECH.

the old machines and the breaking strength went up five pounds on an average. He said he had the speed of the two blade beaters cut from 1,500 r. p. m. to 1,000 and that afterward the breaking strength went up five to ten pounds of where they had been getting it.

"It has been my experience," continued Mr. Webber, "that in making experiments, they are generally prejudiced before they are tried. In other words, when we try an experiment in the mill, it is generally conforming to our previous ideas rather than denying them, and the results obtained are largely governed by our own ideas of what we ought to get before we try the experiment."

J. O. Edwards, overseer of carding, Lancaster (S. C.) Cotton Mills Co., said that on his return home from the carders' meeting in Charlotte, he had tried the plan of running his pickers with three or five laps, a plan that had been discussed at the meeting. He said that he did this on Atherton pickers by placing the belt in the center of the cone and adjusting the screw in the center and then the little screw that works at the bottom, running in or out, to make the lap even. In other words, he explained, he would make the belt take care of the lap.

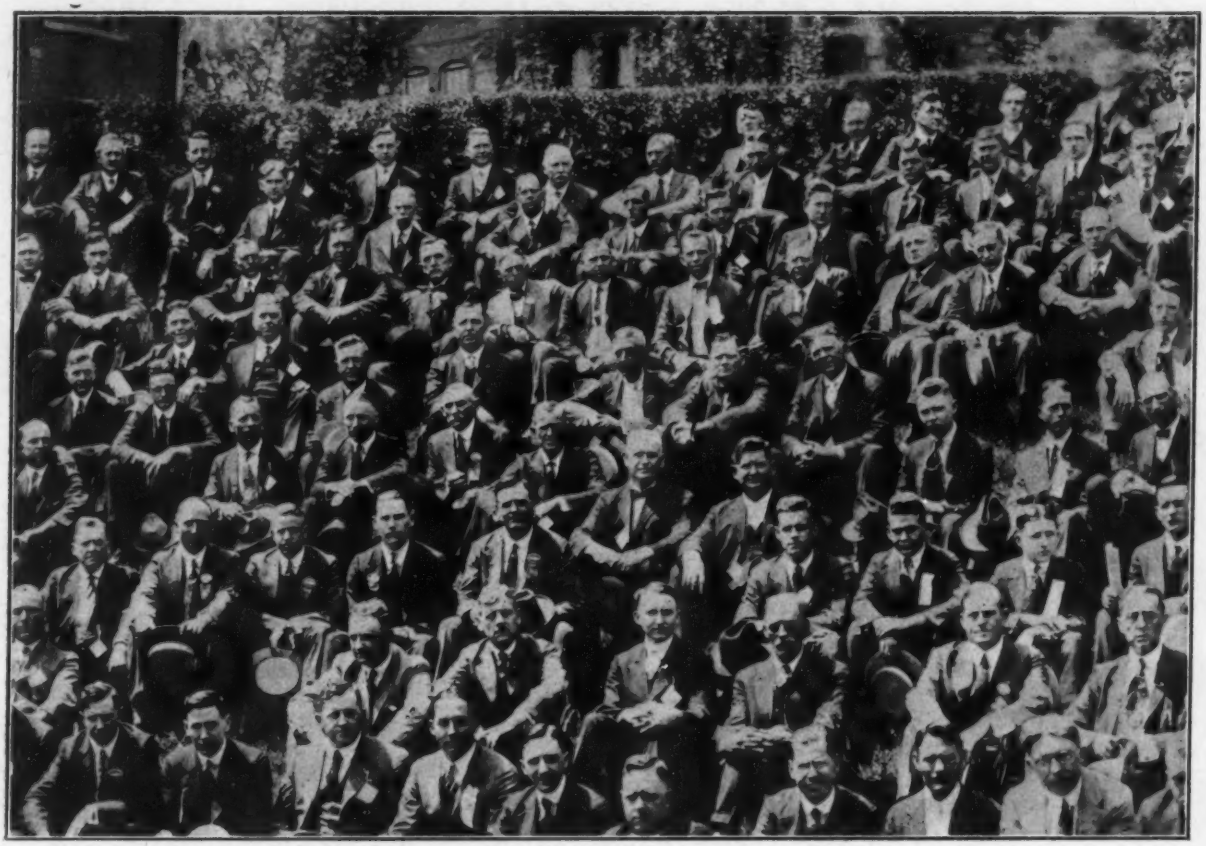
The chairman then called on F. Gordon Cobb, general superintendent, Lancaster (S. C.) Cotton Mills Company, for an expression along these lines, and Mr. Cobb said:

"I think that at the meeting in Charlotte we practically standardized two things, and that was the speed of the beater and the number of inches being fed to the beater. Up until that time there was a great diversity of opinion as to what the speed of the beater should be and what results we would get when we reduced this speed. When it first came out in the South, many men made changes in different ways to try and get the same results. Experiments made since the Charlotte meeting have practically fixed what we should run our beaters at and the number of inches we should feed to that beater. I believe we have made a great step forward in smoothing out, so to speak, the diversity in opinion along this line.

"Another point brought out at Charlotte was the setting of the feed plate to the licker-in, also what we theoretically term as light, quick carding," continued Mr. Cobb. "There have been many ways we have tried to get results from light quick carding. One mill brought out that it could not put in more cards, and was experimenting with light, quick carding by making the card sliver lighter. Others made the lap lighter, while others reduced the speed of the doffers. You will find that Mr. Dilling has practically established a standard that has been compiled from information from all the important mills in the South."

As an illustration of the value of this, Mr. Cobb made the illustration that if the president of a southern mill should call into his office 150 of the best carders and superintendents in the South, and should ask each his opinion as to the setting of the feed plate to the licker-in on a certain kind of work, and if 100 of these experts should give him about the same answer, then that setting would be just about as correct a setting as could be gotten. Such is the manner in which the recommendations of the sectional committee chairmen are secured.

"It will only be a short while," emphasized Mr. Cobb, "until the mills of the whole United States will look forward to the minutes of the Southern Textile Association



meetings as something that cannot be found in text-books; if we keep up these tests we are going to have something that the textile industry has never had before."

At this point, Chairman Dilling took up the first recommendation made in the report just read, in regard to an efficient opening system, and asked for discussion along this line. "Mr. Johnstone spoke awhile ago of the porcupine beater," he added, "and if you have an efficient opening system a porcupine beater is not essential to have in there, as the porcupine beater will do the same work as the opening system. That's why I do not consider the porcupine beater as a process. There is only one way to restore the cotton to its natural condition and that is to give it air. After compression it has lost some of its natural elasticity and should be thoroughly aired."

M. W. Darby, superintendent, Cherry Cotton Mills, Florence, Ala., said, "We had an English-made, vertical type of opener that is now being made in this country, and I find that we make a better lap from the breaker, than formerly from the intermediate." Mr. Darby then asked for some experiences with ball bearings on aprons. He stated that they had installed ball bearings on their aprons and that so far they had given very satisfactory results, but that they had not been in operation long enough to allow a thorough conclusion as to their value.

Mr. Dilling asked Mr. Darby what his variation was before equipping with ball bearings, and the reply was that formerly the lap ran from 5,600 to 5,900, but that afterward the variation had been reduced to about 50 or 75.

"Very good," said Mr. Dilling.

Gordon A. Johnstone said, "I have used the vertical opener for seven or eight years and I believe this is one of the best processes ever made for opening cotton.

"Another thing, I am a little bit of a crank on opening and ageing cotton, and I believe it should be kept in bins for at least 24 to 36 hours before being put into the machine. I believe more air gets into the cotton, and makes it easier for the machine to perform its proper functions. Even though it costs a little more, I believe plenty of air helps it wonderfully."

Mr. Webber said that he has a bale breaker in the warehouse and tries to keep ready from three days to a week's run of cotton all the time.

Mr. Dilling asked these two gentlemen whether they run the cotton through the feeder and then air it, or would they want to air it and then let it age.

Mr. Johnstone replied that he had rather run it through the bale breaker and get it soft and fluffy and into a condition so that the air could get into the cotton, evenly and the same amount in each bunch. One reason for uneven laps, he said, is uneven bales, and if the cotton is dumped into bins and allowed to stay there, it is almost practically true that the same amount of moisture will obtain throughout the bunch.

Mr. Webber stated that he agreed with Mr. Johnstone in all of these opinions.

The question of ball bearings was taken up at this point and L. L. Brown, superintendent, Clifton (S. C.) Mfg. Co., said, "I put ball bearings on the pickers, and my man doesn't have to adjust the laps three or four times a day. I find in measuring the lap that we have a variation of only

about 8/10 of an ounce. I also find that we make much better work after putting the ball bearings in."

Mr. Johnstone asked the following question of Mr. Dilling: "Have you any information as to the best draft—4, 5, 6, 7 or 8—to use on pickers?" Mr. Dilling replied that he did not.

A man in the audience asked the specific question, "What is the proper distance the beater should be set for a 20-ounce lap, four into one? What distance should we set the two-blade beater and what should be the draft?"

Mr. Edwards, of Lancaster, stated that on a 20-ounce lap on the picker, the draft on the intermediate should be 4½. The setting of the beater should be 5/16 of an inch, the finished lap on the finisher picker to weigh 11 ounces. This was from 1 1/16 inch staple.

Mr. Cobb, of Lancaster, took up the subject of picker drafts, and said that most men run the drafts that were originally on the machines. "I think it would be well for us to ask for experiences along this line. There is no reason," he pointed out, "why we should continue to use the drafts that were rigged up at the machinery shops, if these are not satisfactory. Let us make tests to determine what will be the best settings for us to use."

A gentleman from Pelzer, S. C., stated that he had made some experiments with picker drafts and had found that over 4.30 was too long to use on 1-inch cotton. He had tried 5 before, he said in answer to a question, and as that was unsatisfactory had gone to 4.30 but had never gone below that. He is making a 14-ounce lap.

At this juncture, President Boyd reminded the men that the time was slipping by and he would be forced to bring the discussion on carding to a close at this point to allow the presentation of the spinning report. He asked, however, that the men send in any questions on carding to the sectional committee chairman.

Report of Spinning Committee.

The president then called upon Carl R. Harris, Lancaster (S. C.) Cotton Mills Co., who is chairman of the committee on spinning, to present the report of that section. Mr. Harris recounted the experience of the Association in developing information along spinning lines, and related briefly what was done at the sectional meeting of spinners in Spartanburg. He continued by saying, "At these sectional meetings we do not propose to try and establish any standards, for that should be the work of the Association as a whole. What we aim to do is to get together and take up the different phases of our work, and the many perplexing problems that are encountered daily, and discuss and thrash them out thoroughly. Then present this information at the next meeting of the Association for further discussion.

"At the meeting of spinners in Spartanburg there were quite a few important things taken up for discussion and thrashed out thoroughly. Owing to the limited time this morning I will only mention five of the most important ones. I will present them in the form of a question and give you the consensus of opinion as brought out at that meeting. Then we wish to have discussion here and pass on these matters so they may be entered in our minutes as standard. That was what I intended doing this morning, but Mr. Boyd's suggestion in regard to a system of running tests on the things taken up at these sectional meetings promises to be another stride forward. Though I do not

know any details of the plans he has in mind I will not call for a vote on these questions as intended, but we wish to bring out all the discussion possible.

"Mr. Walen, who is engaged in research work for Lockwood, Greene & Co., made a talk at the meeting in Spartanburg and spoke of the variation in numbers of yarn that he had found in a test and I would like to ask what variation there should be in numbers of yarn. Since that meeting, has anybody made a test from all their frames, or in other words, tested the yarn from both sides of every frame to determine the per cent of variation in numbers?"

At this point Mr. Boyd stated that since the Spartanburg meeting, he had made some tests and was surprised to find that he had a very large variation and one which was much larger than he thought should be the case. He was making 30s, he said, and he found that the yarns varied anywhere from 27s to 31s in number.

He said he tried the plan of testing four bobbins at a time and found that one day he could size four and they would be 30s all right, while the next day they would be something else. Then, he said, he took bobbins from every side in the room and found that they had an unusual variation in numbers.

Mr. Johnstone brought up the point that in doing this, it would be found that in different sections of the room the humidity would vary—some parts of the room would be drier than others—and said this probably accounted for the variation in numbers.

C. H. Goodroe said, "I have had some experience with uneven numbers and have found that uneven humidity has a great deal to do with it. Also, a great many mills will find that they will have trouble because of having their rolls re-necked. When this is done you get a difference in the size of the rolls."

"We have been experimenting with variation in yarns," said Mr. McAuley, of the Coosa Mfg. Co., Piedmont, Ala., "but in different parts of the room we of course found different conditions, as the other gentlemen have pointed out, so what we are going to do now is to adopt a sizing room —a central station—which will be properly humidified and in charge of one man, where our experiments will be conducted. We do not make anything but yarns for the market, and of course are interested in eliminating variations in these yarns, so that we can make better work and have no kick coming from our customers."

Mr. Darby suggested that the higher the draft, the greater will be the variation in numbers. He stated that in making 12s yarn he had found that the variation was from 11.80s to 12.20s, but when he made 10s from the same kind of roving, the variation was reduced.

W. W. Gayle, Saco-Lowell Shops, brought up the point that if the Association were to attempt to establish a standard variation for yarns, could it be made definite and could it be worked out to apply to all numbers and all kinds of goods?

It was necessary to bring the discussion on spinning to a close at this point, as it was nearing noon and the time when special trolley cars would be waiting to convey the members to the Georgia School of Technology, so President Boyd announced that this discussion would be continued at the morning session on Saturday. He then appointed the committee on resolutions which consisted of the following men: Frank Heymer, chairman, T. W. Mullen and Jas. A. Chapman, Jr.

Visit to Georgia Tech.

Immediately following the adjournment of the morning session, the delegates were conveyed on special trolley cars to the Georgia School of Technology, just out from the center of the city, where they made an inspection of the A. French Textile School of that institution, under the leadership of Professor C. B. Seal, director of the textile school. After this tour of inspection, they gathered on one of the terraces at Tech where a group picture was made. Following this, the delegates heard an interesting talk by Professor Wallace of the Tech faculty. Then they repaired to the mess hall of Tech, where they were served with a complimentary luncheon. During this luncheon several musical numbers were furnished by members of the Tech mandolin club, and the guests heard a few words of welcome from Doctor Emerson, dean of the Georgia School of Technology. After this function, the body went to the auditorium of the Georgia Tech Y. M. C. A. for

The Afternoon Session

which was called to order shortly before 2:30 o'clock by President Boyd. The first speaker was S. B. Rhea, master mechanic, Victor-Monaghan Mills, Greenville, S. C., who was called upon for the report of the power committee of the Association, of which he is chairman. Mr. Rhea explained that due to the limited time, and the length of his paper, he would read only a few excerpts, but that the report would be printed in full in the official book of proceedings of the Association for those interested.

Following Mr. Rhea, President Boyd announced that it was impossible for W. H. Gibson, Jr., superintendent, Buffalo Mills, Union, S. C., who is chairman of the weaving committee, to attend the meeting, but stated that his report would be presented by S. R. Lybrand, of Union, S. C. He then introduced Mr. Lybrand, who read the report of the committee on weaving.

The report gave a summary of the sectional meeting of weavers held in Greenville in February, an extensive report of which appeared in the April number of COTTON. Continuing, Mr. Gibson stated in the report:

"The results obtained from the weave room are the basis on which everything in regard to the success of the mill depends, and there are many details, such as the setting of looms, the importance of setting the take-up, the let-off, the harness, the whip roll and the sand roll. Your vibrating whip roll cam has its bearing upon the appearance of your finished products. Also, a little effort on the part of keeping the selvages of your goods as well as the general appearance of your cloth, has a great deal to do with the sales of your goods.

"I think that many of the mill men, and of the operatives also, see so much cloth until it is only a natural tendency or human element that loses respect for cloth. Therefore, it is given unusually rough treatment, and does not leave the weave room or cloth room in the very best of condition, but on the other hand the end is soiled, the cloth is wrinkled, a large selvage on one side and a small one on the other, which has a great deal of bearing on the cloth when it is put in the finishing works. This gives the mill a 'black eye' and makes it harder for the mill to dispose of its goods than if they were handled in the proper manner. Of course there is always room for the weaver to come back with the argument that in order to turn out a high percentage of production and a lower percentage of seconds, it is necessary—to which we agree—to give him

good material with which to turn out good work from his department. But even with the best yarn conditions and everything as near right as it is practical to be had, it can be ruined in the weave room, and particularly in the slasher room. If proper care is not taken in the slasher, you cannot expect to have good weaving.

"We do not recommend nor condemn any particular sizing, as there are many good materials on the market, but we do think that this is a very vital question which every man should consider, as to what he is dumping into his size kettle, and many good sizings do not give good results because of improper formulas, and not being handled right in many ways. Several years ago I had an opportunity to observe such an instance. We were operating the mill on 30s yarn, and the weaving was not going good, making an unusual amount of waste. It was discovered that the sizing in the size vat was so high, or so full, that the proper heat could not be obtained, therefore the sizing was cool in the size vat, and shedding in the weave room, making it very hard to dry on the slasher, and many warps would come off and were put into waste, but with the same sizing and the same yarns, the sizing was changed from cooking on the 40 minute rate to cooking it one hour and reduced the size in the sizing vat to about three-fourths of the emersion roll, which gives much less size in the vat, and the temperature in the size vat was increased from about 160 degrees F. to 200 degrees. After this change was made, the production increased considerably, and the seconds decreased to a very noticeable degree, and the waste was cut down to a very satisfactory amount."

Mr. Boyd stated at the conclusion of this report that he had hoped to be able to bring out some discussion on weaving at this meeting, and that in Mr. Gibson's absence, he would substitute himself and do what he could. He first asked how many who attended the weavers' meeting in Greenville had since made tests on slashing, and only one man indicated that he had. This was D. W. League, overseer of weaving, F. W. Poe Mfg. Co., Greenville, S. C., and when asked by Mr. Boyd to relate his experiences in this connection, Mr. League said:

"The tests we have made were in regard to our sizing warps. Our number of yarn is practically around 30s. We have for a number of years used corn starch, and our staple is supposed to be about 1 inch. We have used the Lowell frame altogether. The older type has a rather shallow size box, while the newer types have a deeper size box. We used a 300 pound roll with a light jacket, and we found that in using this 300 pound roll we had to run our size about ten or twelve and sometimes above, according to the speed and the pounds of steam we were forced to run on our cylinder.

"We found we had a surplus of sizing materials on the yarn from the simple fact that it would knock off on the frame and also when we carried it to the loom it would knock off there.

"The idea occurred to us that possibly it might be caused by the length of time that we cooked our size, or the way we prepared the formula, or it might be caused by the amount of heat we had in the size vat as the yarn passed through. We made tests on the length of time in cooking the size, in agitating the starch before we put the steam in, and we also made tests as far as it was practical without using a thermometer. This was largely guesswork, to be sure, but almost any man can see when size is boiling at a great rate or not boiling to amount to anything.

"We found that that did not give us the result because this yarn seemed to be flattened out considerably, and when it came to the leese rods on the front, it was difficult to get it to the weave room without developing soft warps. It would break quite a number of fibers and cause them to loosen up and 'sprangle' out and the yarn would look very wooly as it came over the whip roll. The sizing material would knock off, etc.

"The slasher tender and I had used the heavier 500 pound roll, and we agitated this question to the extent that we got the management interested, and procured a 500 pound squeeze roll. Now, we had been using a heavy jacket, something like a 24 ounce jacket, and we experimented with that, and then we tried a 16 ounce and an 18 ounce jacket. We then used the heavy roll and the 16 ounce jacket and tried this jacket six yards long. We did this, that we might retain the roundness of the yarn as it passed through the squeeze roll and also the lighter weight that it might not as it grows wet get hard, and will not flatten out the yarn, so that it will be left round. We also boiled the size just about as strong as our box would allow it to be boiled without causing it to fill up back of the yarn, back of the squeeze roll, and make hard places in our yarn as it passed through the slasher. We found by boiling it good and strong we could get all the size necessary on the yarn, and running that method, rolling over it squeezes it off, and as it went over the cylinder we only had to use between six and eight pounds.

"That would vary with the steam in the boiler, but ordinarily it was necessary to have six or eight pounds of slasher steam to dry this yarn.

"We found our yarn had a great deal more elasticity left in it by running it over that way as well as saving our dear friend down at the coal pile a little bit. We found after it went through the leese rods that it didn't have that appearance that it had when it ran on the light roll. We had very little knocking off at the slasher, and when we got it to the weave room, it was remarkable, the small amount of knocking off of sizing materials. Therefore, we claim that the heavier roll with the light weight jacket is the thing to use, and this jacket should be taken off at least twice a week and washed out thoroughly, and then put back. It is a great deal better than using the light roll. These are the results we have obtained, and more than that, the real result that we have obtained is the good running properties of the work. Our work is running a great deal better, and our production has been increased, I would say more than 10 per cent and our seconds have been decreased something like four per cent."

At the conclusion of Mr. League's remarks, President Boyd asked the men present how many had 500 pound rolls on their slashers. Very few indicated that they had. He then asked how many knew the weights of their squeeze rolls and only one man put his hand up.

G. P. Jeter, superintendent, Consolidated Textile Corporation, Henderson, Ky., said he had tried it with less steam, and that he only has to run four or five pounds of steam on the slasher, and he gets a round yarn and the work runs better. That, he said, is about as full as he can make it. In reply to a question from the chair, Mr. Jeter stated that he uses more starch than he did formerly.

One man present put ten per cent starch in the yarn,

it was found from a question asked to that effect by the president. Then Mr. Boyd asked the question, "How do you find out you are putting ten per cent starch in it and what is the number of your yarn?"

John H. Howarth, superintendent, Lanett (Ala.) Cotton Mills, was the one who had indicated he was putting in ten per cent, and he arose and said:

"I take my yarn from the slasher and weigh it, take two yards off of the beam, and weigh that, and take four ends and lead it over the slasher and get the same number of yards and I put in nine to eleven per cent. I think about ten per cent generally.

"While I am on my feet, I would like to ask one question," continued Mr. Howarth, "I have got a circulating system on nine slashers. I am just starting to run warps that have 5,300 ends to them and I also run some of 1,500 to 1,600 ends. I have got a circulating system all connected. What is the best way for me to get my size on my 5,300 without putting too much on my 1,500 and without disconnecting the slasher? I am going to separate two slashers for the heavier work, but if there is any easier way I would like to have that information."

C. P. Dill, overseer weaving, Brandon Mills, Greenville, S. C., said that he has a circulating system on seven slashers, and runs a warp of 3,144 ends. The only way, he declared, that he had found to get more size on the heavier work is to put in an extra feed line. They have two feed lines that go half way down—go down over four frames—and they have two pumps. By that means they can put in as much sizing as they want or as little as they want. He stated that by actual test they are putting in around eight per cent sizing on the yarn. Asked how he finds the percentage, he explained his test as follows:

"I have got some scales and a reel that I use in my office, and I reel this yarn, weigh it, then size it, weigh it again, and get my percentage that way. That's one way I get it. If I want to get the entire set, I size the entire set and weigh each piece separately."

Mr. Howarth, of Lanett, explained another way of making the test, in the following manner:

"I take off ten yards of yarn after it is sized, and take off five yards of cloth after it is woven. I send one to the finishing room and have the starch taken out and that checks me up on taking my yarn as it was running over the slasher."

Mr. Boyd stated that they had made tests at several of the mills of the Chadwick-Hoskins group, of which he is general superintendent, and then called upon H. S. Wylie, overseer of weaving in one of the mills, to explain the methods they use. Mr. Wylie said in part:

"I make a test every week on my warps. I put in on the slasher 1,632 pounds of yarn and got a gain of 81 pounds. That gave me 5.17. Afterwards I made tests on cloth and ran it through the cloth room, and figured up the weight of filling I got and I wove in my cloth about 3½ per cent. That was the best I could get on it.

"On one test I made there were three different kinds of goods. I made tests on another one—a lighter piece of 15 and some few pounds—and I had a gain on this one of 5.51 on the light one.

"On another one of the same class I got some stock from the No. 2 mill and on all of his yarn I gained 91 pounds to the set, an average gain of 5.70. The largest gain in the whole thing was 6.10 on 40s.

"I weigh every bit of yarn coming off the slasher and then I weigh it in front, weighing all my waste back, and give the slasher a fair showing. It comes around about 5.50 as an average. From the No. 2 mill it figures about 6.50, or somewhere along there.

"I make up my kettle of sizing, weigh the size, and have my water at a certain gauge, and measure the water in buckets, and see that I have the actual amount of water in the size that I want. I cook it one hour and forty minutes as hot as I can get it from the time it begins to boil, and I get better results from cooking the size for this length of time than for a shorter period of time. Again, it does not take quite as much starch. I have run 80s-square with a right smart more starch, 110 pounds of starch to 100 gallons of water.

"In cooking my size I boil it as hard as I can without running it over. I dry all my warps with three pounds of steam. Now, in drying, we must remember that we don't want a bone dry warp, but a cotton dry warp. Another thing I would suggest is, when you go to cooking your size for your warp, don't cook it so hard that your cylinders will burn it."

It was necessary, Mr. Boyd announced, to bring the weaving discussion to a close, as there was another important subject to be considered at the afternoon session. He said that there would probably be an opportunity for further discussion on weaving subjects at the Saturday morning session.

Report of Finishing Committee.

He then called upon John W. Clark, superintendent of the bleachery at Erwin Cotton Mills Co., West Durham, N. C., who is the chairman of the Association's committee on finishing, to give the report of that committee. Mr. Clark said in part:

"The committee on finishing has been in correspondence with a number of finishers of cotton fabrics, and while this report is by no means complete, there are a few things which we wish to submit for your attention at this time. It is the consensus of opinion that if the manufacturer will observe more closely the following points in regard to goods shipped to the converter that it will very greatly benefit all parties concerned.

"1. Mark each bale distinctly in good size type.

"2. Stencil plainly on the outside of each bale the destination, bale number, yardage, style, construction of goods and name of shipper. As an extra precaution it is also often advisable to use a double wired cloth or fiber shipping tag.

"3. Burlap each bale all over and underneath; use a good grade of paper to prevent dust sifting through.

"4. Use a good grade of baling ties or rope. Old ties often rust through the burlap and damage the goods.

"5. Put in each bale a packing slip, giving the number of the bale, the detailed yardage of each piece and the style and construction of goods.

"6. Carefully measure the length of each piece of cloth.

"7. Mark the yardage on each piece but do not use an indelible pencil.

"8. Do not fold two pieces in one. This causes loose ends in the bleach house. Fold each piece to itself.

"9. Do not sew the pieces together. The finisher prefers to do his own sewing.

"10. Do not sew colored strings or tags along the sel-

vage to show imperfections in the goods. Such strings bleed and mark off on the goods. They also cause tears.

"11. Do not tack or stitch the ends of the pieces, this is liable to cause damage to the selvage.

"12. See that the burlap covering is not sewed to the goods. In a number of instances this has been known to result in damage.

"13. Keep the ends of the pieces clean. Frequently pieces are found that are dirty from one to two yards on the end.

"14. Carefully brush the goods to free from lint, motes and black specks.

"15. Carefully examine the goods for bunches or slugs of filling. When back-filling, such places almost invariably result in breakages in the cloth.

"16. Inspect closely for oily filling, oily warp and also black oil that gets on the goods after it is woven.

"17. Lastly, inspect the goods that are going to the converter just as closely for weaving imperfections as those that are going direct to the trade.

"These replies are not complete," continued Mr. Clark, "but they cover the situation as well as it could be covered in the short space of this report. In some cases the replies that were received and from which these specifications were made, seemed to indicate that they (the finishers) had the impression that the goods had not been inspected as closely as they should be. That was the basis of this report. Mr. Boyd was very much interested in trying to establish what is really a first, what does a piece of goods have to consist of to be first quality? This is just a sample along that line."

"It seems to me that that is very interesting to all of us," said Mr. Boyd, "in shipping cloth we usually have to put it in double cuts, 120 yards to a cut. You all know it is simply impossible to make 100 or 120 yards of perfect cloth. Now then, when we get a piece of cloth made, we all have our ideas of what is first quality, and you may disagree with me, and I may disagree with you. We look over the cloth and still we disagree. We cannot get any agreement as to just what ought to be in that piece of cloth to call it a first piece of cloth, or in other words, when it should be condemned as a second. You take any kind of cloth, and it should be so wide. All you weavers and superintendents know that it will vary in width, unless it is on some special loom. Now, how much ought that cloth to vary to make it become a second? How much should be the variation in the width of it, in the weight of it, and in its thickness?

"Could this Association establish a standard for a piece of cloth, or standardize all cloth? If we can do that, then we are not going to have a piece of cloth turned down on us when it really is first class."

"I don't believe that this audience could tell that such a standard could ever be gotten up," replied Mr. Howarth, of Lanett. "All of us know that on any kind of take-up, it doesn't make any difference whether high or low, the width of a bolt of cloth of 300 yards will vary according to the tension on the warp.

"Besides," he continued, "there is hardly any inspector of fabric who lays down any specifications that might be regarded as standard. About all I know of is that they make a minimum requirement for fabrics, below which the inspector will not accept it.

"I guess you had experience with the Government inspectors in time of the war. I tried every inspector who came around to find out whether he had any standard by which he was going to classify the goods we were making, and I could not find any of them who could give me any kind of a standard at all. The inspector would look at the cloth and if he thought it all right, he accepted it. Why, I had one inspector to reject twenty cuts, and I put them over to one side, and the very next inspector accepted them.

"Another thing. Cloth that was accepted two years ago would not be accepted today without a kick. You have to make a better piece of goods today than you have done before. I personally feel that a piece of cloth of 100 yards that has five mispicks in it is a second. If I get four, and there is nothing else the matter with it, I will let it go as a first. If I have got a thread run for a yard and a half, I count that as two mispicks. If we could get a standard or a classification that so many mispicks made a second it would be a most wonderful thing for the cotton mills, but I am disposed to think that that is the hardest thing in the world, after all is said and done.

"Where does your classification come in?" asked Mr. Howarth. "You hire a girl, and she burls for two or three months, and then you put her over by the window and she classifies your cloth. The overseer cannot see them all, and you have got to take that girl's judgment for it. If you could have a standard whereby she could go, it would be worth something to us.

"Say she classifies a piece of cloth as a first, and she catches the devil some morning about a piece of cloth that should have been classified as a second; after that she takes no chances and everything goes in as seconds. I have inspected many pieces of cloth thrown down for seconds, and found they were firsts. Then another thing, when the overseer gets grouchy, she won't take any chances. If the overseer is in a good humor, the seconds will drop down to two and three per cent.

"So I believe the classification of cloth, firsts and seconds, is in the hands of the Almighty."

When Mr. Howarth had concluded, President Boyd called upon M. G. Stone for a few remarks in this connection, and Mr. Stone's opinion coincided with that of Mr. Howarth—that "we would have to do the best we can and trust to the Almighty."

Asked directly by President Boyd if he thought it would be possible to standardize a piece of cloth, Mr. Stone replied:

"I don't know. We probably should have some kind of an agreement between the seller and buyer, as to how many defects in a piece of cloth of say 100 yards would be required to place that piece of cloth in seconds. Possibly we could do it in that way. That would have to be decided between the buyer and seller. We are all trying to make our cloth as good as possible, and if the prices justified it we could no doubt make better cloth. It is a pretty hard matter, Mr. President, to get at, unless we put it on the number of mispicks and thread runs, or some other imperfections. There must be some understanding with the buyers."

Mr. Boyd declared at this point that the time was up, and the delegates were asked to go across the street to Grant Field to witness the ball game between Georgia Tech and Washington and Lee University.

The Baseball Game.

Following the afternoon session, the delegates went to

the Georgia Tech Athletic Field, where they witnessed a fine baseball game between the teams of Georgia Tech and Washington and Lee University. They saw the W. & L. team score the first counter of the game in the first of the third inning, saw both sides tighten up until the last of the seventh, when aided by the strains of "Ramblin' Wreck" from the Georgia Tech band under the leadership of Wop Roman, the Tech bunch staged a come-back and put three men across the home plate, and then again scored another in the eighth inning, making the final score 4 to 1 in Tech's favor. Quite a number of visiting ladies witnessed this game.

At the conclusion of the ball game, the delegates were returned to the city on special trolley cars and at 6 o'clock on Friday evening were guests at the Association dinner on the roof garden of the Ansley Hotel. Here a delightful dinner was served, and here, too, the results of the work of Cliff Perkins and J. R. Regnas came into view in the form of several chorus girls who entertained the diners with several selections, being followed by some black-face stunts and an impersonation of a county judge in old Virginia. The solos rendered by Mrs. Susie Reese Kennedy and Mrs. Shields, two talented Atlanta singers, were most enjoyable.

Theatre Entertainment.

At the Ansley dinner, tickets were distributed among all those present for the 9:00 o'clock performance at the Howard Theatre, and following the dinner, they were honor guests at that performance of this beautifully appointed motion picture playhouse. The picture program featured Miss Pauline Frederick in "The Mistress of Shenstone" and the 30-piece orchestra, under the direction of Enrico Leide, rendered special selections in honor of the textile guests. A feature of the musical program was the direction of this wonderful orchestra in an overture, "Morning, Noon and Night," by Master Louis Kalbfield, a youngster of 5½ years, whom Manager DeBruler of the Howard had procured as a special attraction in honor of the guests of the occasion.

The Saturday Morning Session

was held in the convention hall at the Piedmont Hotel, being called to order about 9:30 o'clock by President Boyd. As had been previously announced, the first thing on the program was the continuation of the report of the spinning committee by Carl Harris, chairman of that committee.

Mr. Harris continued the reading of his report, and presented the five important questions brought up at the Spartanburg meeting, which he had mentioned on Friday morning. He gave these questions and also a little explanation or answer with each. The remainder of his report follows:

"The first question is: Does tape driven spinning give better results than band driven?

"The consensus of opinion of those who had had experience with band and tape driven spinning was that the tape drive gave a much more even yarn, less waste from soft yarn, and that we could get more production. And some said that the spinners could run more sides on the tape drive. I will quote one man who said 'I have used the band and tape and I think the tape drive is far superior and I would pay today twice as much for a tape drive as I would for a band drive frame. I don't suppose we find one bobbin a week that we have to throw out for soft yarn.'

"Question No. 2: Which gives the best results, the No. 2 flange ring or the No. 1?

"Those (at the Spartanburg meeting) who had had experience with both were inclined to be partial to the No. 1 flange. They claimed the friction was less and one man said that he could get more front roll speed.

"Question No. 3: Can we get better results with the clutch spindle than with the plain spindle?

"Those who were using the clutch spindle recommended it very highly. They claimed the waste from soft yarn was more than cut in half, that it gave no trouble, that the yarn was easier to keep off the spindle, and that it held the bobbin down keeping it from jumping up, therefore making the work run better.

"Question No. 4: Will the advantages of using a wide enough gauge to eliminate the separators more than pay for itself?

"In order to give you the consensus of opinion in this case I will make a few direct quotations from the minutes of the spinners' meeting. One superintendent said, 'We threw out 10,000 narrow gauge using separators, and put in 7,000 wide gauge without separators, and got an increased

PRESIDENT ELECT GORDON A. JOHNSTONE.

speed. We produced more pounds on the wide gauge. There is no comparison in the strength of the yarns. We got a twist that very few mills can equal. The yarn was very even, there was no variation in the twist, and we could run less twist per inch and reduce the cost of manufacture by the elimination of the separators fully one-half. I have never seen such running. If I had to choose between a tape driven machine and a wide gauge machine I would take the wide gauge in preference to the tape drive.' Mr. Harris also made other excerpts from the spinners' meeting minutes.

"Question No. 5: Will ball bearings on warper measuring rolls materially reduce the warper beam waste?

"Those present who had used the ball bearing warper measuring roll recommended it very highly. One superintendent stated, 'We find that we average not over 1½ pounds of waste to the set.' Another says, 'Using ball bearing measuring rolls we get an average of about 1½ pounds of waste to the set, where formerly we got three pounds.'"

At the conclusion of Mr. Harris' report, the meeting was turned into general discussion.

The first question to be asked by Mr. Harris was, "Who has had experience with band and tape driven spindles?"

L. L. Brown, of Clifton, stated that he had had experience with both kinds of frames and recommended the tape drive in preference to the band drive. He said that with the tape drive, there is the idler pulley which keeps the tape at an even tension, and with the band drive, a difference in moisture will affect the bands and cause them to get loose. He believes that with the tape driven frame spinners can run 10 per cent more sides. He said that in one mill he put in 7,000 spindles with tape drive instead of band drive.

F. Gordon Cobb, of Lancaster, said that they have one room with 57,000 band drive spindles and another room with 59,000 spindles which are tape driven, and thus they have a very good means of comparison. He said that with the tape drive they would have about 110 tapes for five days a week, and of course each tape represents four spindles. He also related difficulty experienced with the band drive when starting up on Monday morning, stating that this causes a lot of trouble and work, and sometimes it is nearly noon before everything is all right and ready to operate. The tape drive, he stated, is on warp, and the band driven spindles on filling. He stated that they have less difficulty and no slack yarn with the tape drive.

Mr. McAuley, of Piedmont, Ala., stated that they have both tape and band drive, having just put in the tape drive and now having half their spindles on tape drive and half on band drive. He declared that on rainy days the band drives will tighten up, causing trouble. He pointed out in connection with tape drive that the tapes should not be too long to cause them to run slack.

Mr. Dilling, of Gastonia, asked the question, "What is the best way to keep the bearing in the idler in the proper condition? We do not oil it and it gets dry. Often I have to take out the bearing, which is impregnated with something, and clean it."

Mr. McAuley said that they put in a compound grease on Fales & Jenks frames and that for five years they have had no trouble.

Mr. Dilling said the Whitin people had put in his frames and had put in a grease, but now say they made a mistake in doing it, and have cleaned them out.

Mr. Anderson said that he had his pulleys cleaned and then greased them, and that now he gets better results. He said he used to have the same trouble as Mr. Dilling. He said, in reply to a question from Mr. Harris, that this grease was the same as the Whitin people use.

"How many have found that they can run at reduced speed with tape driven spindles?" was asked by Gordon A. Johnstone at this point. "There is a very great advantage, I have found that tape driven spindles run uniformly and at a much slower speed, and the reduction in horse-power is something worth while."

Mr. Cobb asked the men not to get away from the question of oiling yet. He said that in the mill he spoke of, they have never had to oil any of them, and do not have trouble with the tapes dropping off. He then asked the question if anyone who had used band driven spindles had found any method of sewing the laps and if they have found a special thread for this sewing. "Bands," he explained, "sometimes give trouble by wearing out and breaking at the knots, and if we can find a method of sewing the laps to make them last longer we will have accomplished a great good."

A plan for this work is being promoted by one of the men at his mill, stated Mr. Johnstone, but this is not ready to be given out yet.

Mr. Phagan said that he has 20,000 spindles on tape drive and 15,000 on band drive. He said he never oils them and has no trouble at all. Mr. Loftis also spoke here in favor of the tape drive.

Mr. Brown said he ran tape driven spindles for three years and did not oil them.

The next question was asked by Mr. Harris and was in regard to the relative merits of the No. 1 and No. 2 flange. He called on Mr. Chapman, of Inman, S. C., who said that he has five frames with the No. 1 flange, and it seems that he can wind the yarn on the bobbin tighter and get more yarn with fewer doffs.

M. G. Stone, of Spartanburg, reiterated the statement he had made in this connection at the Spartanburg meeting, and said that his experience with the No. 1 flange had been similar to that of Mr. Chapman. He said at their mill they are changing about 16,000 spindles with No. 2 flange and putting in No. 1. He said that he is not putting No. 1 flanges and No. 2 flanges in the same room because he does not believe it will work well that way as it will require the use of different travelers and cause trouble.

Mr. MacIntire said that his idea of the No. 1 and No. 2 flange was a matter of where it was desired to have the friction—in the flange or in the traveler. He expressed it as his opinion that rings would wear out quicker with the No. 1 flange.

Mr. McAuley, of Piedmont, Ala., said, "We have recently put in 18 frames with the No. 1 flange, and we find that we can get a higher speed. On these frames with the No. 1, on which the front roll speed had formerly been 93 r.p.m. on 48s, this speed went up to 105 r.p.m." This flange, he said, was an extra double burnished and was very excellent, giving about a 12 per cent increase in the front roll speed. This is on filling wind.

Mr. Harris next brought up the question in regard to clutch and plain spindles, and Mr. McCall, of Union, said, "We have put in 40 frames with the clutch spindles, and we find them very satisfactory. We do not have the trouble experienced with the old style of the bobbins jumping up and we have increased the front roll speed about 16 turns. I like them very much." In reply to a question from Mr. Chapman, Mr. McCall said their number of yarn was 29½s warp. He also said, replying to Mr. Harris' question, that he had no trouble with the yarn tangling up in the clutch.

"Regarding the clutch spindle," said Mr. Stone, of Spartanburg, "we have 15,000 of this type of spindle on filling. I made a report at the Spartanburg meeting. As I stated at that meeting, I only wish that we had had them on all our filling spindles. They are very satisfactory and we hope to put them on all our spindles some time."

J. F. Long, of Douglasville, asked Mr. McCall if he had any trouble with the yarn getting around the blades on the spindles and received a reply that Mr. McCall had not had any trouble in this respect so far.

With a few other remarks the practical discussion was brought to a close, and the Association entered into its business session, and the meeting was declared open for nominations for president for the coming year. Gordon A. John-

(*Continued on page* 582.)

Computing the Price Paid for Weaving

BY GEORGE L. WARFIELD.

[In the preparation of Charts 1 and 2, two separate drawings were made for the sake of clearness. In the original chart submitted by the author, the lines and amounts on Chart No. 2 were superimposed on Chart No. 1, but the necessary reduction to make such a chart fit COTTON'S pages would have made such a chart very difficult to interpret. Also for the sake of clearness, the even yarn numbers are omitted from the charts, although their location is made evident by the slightly extended lines in the left margin. Reference letters were also added to Chart No. 1 in order to partly clear the chart of explanatory phrases.—The Editors.]

Section 116, Chapter 193, of the General Acts of 1919 of the State of Massachusetts requires the posting, in places accessible to the operatives, of a detailed schedule of the method used in the computation of prices paid for weaving. While, up to the present time, State officials have not insisted upon any compliance with this law, because, as one of the State Inspectors expressed it, they know of no formula or any possible way of complying with it, still, a number of mill managers and superintendents have made the effort. It would be interesting and educational if some of these mill executives would explain through the columns of COTTON how they have gone about complying with this law. As I do not wish to appear to be asking for anything I am unwilling to give out, I am outlining in this article the method we use in our mill.

We have made our schedule up in the form of a graphic chart. (See Charts 1 and 2.) The chart has Sley Reed or Pick along the top with sizes of Warp Yarn or Filling down the side. The diagonal lines on the chart are true logarithmic curves or diagonals and are found by dividing the yarn or filling number by the square of the sley reed or pick, one setting of a slide rule gives the location of any certain diagonal. All combinations of yarn and sley reed falling on a certain diagonal will all weave with the same difficulties, consequently the same price should be paid for warps of all combinations of yarn and sley reed falling on the same diagonal (sheds, widths, etc., being the same).

The numbers at the ends of the diagonal lines are proportional, and were taken from the "Cloth Construction Tables," on pages 130 to 140 of the Draper Company's hand book, 1907 edition. The chart can be used in all ways the same as the cloth construction tables in Draper Company's 1907 hand book.

The base price is figured from the New Bedford standard weaving price, May 31, 1920; viz., $0.52 for a 47 yard

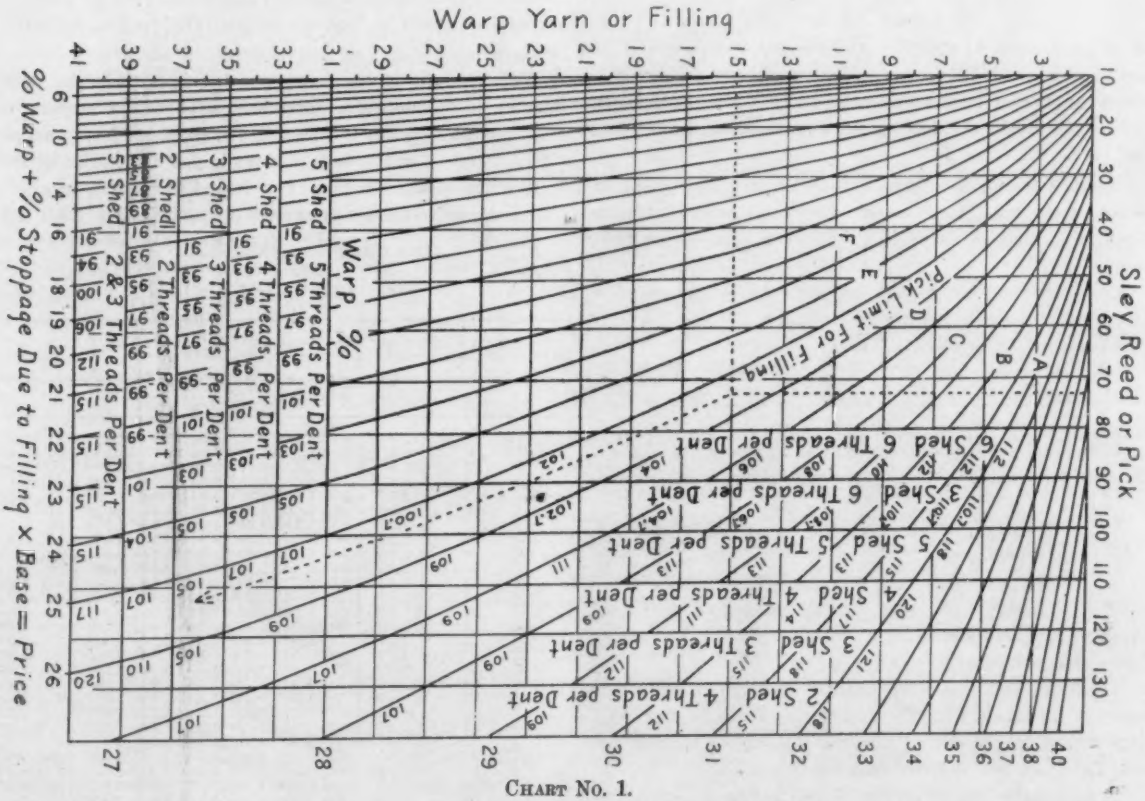

Warp Yarn or Filling
% Warp + % Stoppage Due to Filling × Base = Price
Sley Reed or Pick
Warp %
Pick Limit For Filling
2 Shed 2 Threads Per Dent
3 Shed 3 Threads Per Dent
4 Shed 4 Threads Per Dent
5 Shed 5 Threads Per Dent
2 & 3 Threads Per Dent
6 Shed 6 Threads per Dent
5 Shed 5 Threads per Dent
4 Shed 4 Threads per Dent
3 Shed 3 Threads per Dent
2 Shed 4 Threads per Dent
A
B
C
D
E
F

CHART NO. 1.

CURVE A—REED LIMIT 6 THREADS PER DENT.
CURVE B—REED LIMIT 5 THREADS PER DENT.
CURVE C—REED LIMIT 4 THREADS PER DENT.
CURVE D—REED LIMIT 3 THREADS PER DENT.
CURVE E—REED LIMIT 2 AND 3 THREADS PER DENT.
CURVE F—REED LIMIT 2 THREADS PER DENT.

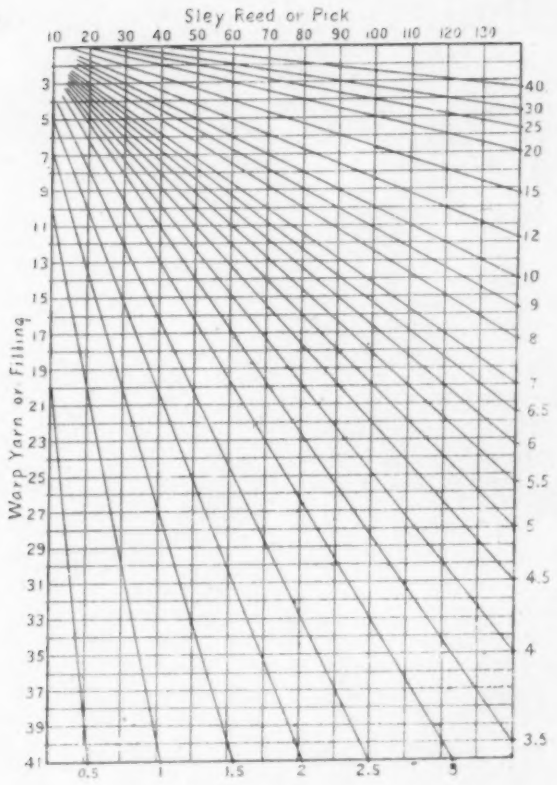


CHART NO. 2.

cut of print cloth 64 x 64, 27 inches wide, 30 inches wide in reed, loom speed 175 r. p. m., 28s warp and filling, and where the weaver runs an average of 14 looms. Price per pick equals $0.52 divided by 64, equals $0.0081115, price per pick.

What is the price per pick (base figure) for goods 38 inches in the reed, made on an automatic loom that runs 150 r. p. m., and 58 yards to a cut, where the weaver runs 14 looms?

Use compound proportion, as follows: (The use of a slide rule will facilitate computations.)

(Yards)	47	:	58				
(R.P.M.)	150	:	175	::	.0081115	:	X
(Looms run)	14	:	14				

Therefore X = $0.011677 = (Base)

Individual readers can change the values given for the factors in parentheses to suit the requirements of individual mills.

What is the price per pick paid for goods of the following specifications?

A. Warp 15s; sley reed 73; filling 18s; picks 44; 3 shed; 38 inches wide in the reed; 58 yards to a cut; loom speed 150 r.p.m. and with a weaver running 14 Draper looms, automatic.

1. Start with 15s warp yarn, following dotted line to where it intersects with the dotted line from 73 sley reed, then following the dotted diagonal line to "3 threads per dent" and we get 105 per cent for warp.

2. Opposite 18s filling, in Table 1, find 1.7 per cent, stoppage due to filling for goods 38 inches wide in the reed.

3. Add the values obtained in paragraphs (1) and (2). 105 per cent plus 1.7 per cent equals 106.7 per cent.

4. 106.7 per cent multiplied by $0.011677 (base) equals $0.01245 = price per pick. In some mills it has been found that the deduction, "Stoppage due to filling," is practically negligible for automatic looms.

5. Forty-four picks at $0.01245 per pick equals $0.547 per cut.

What is the price per pick for the foregoing goods 30 inches wide in reed instead of 38 inches wide in the reed?

6. If the goods woven are narrower than the standard for that width of loom, then subtract 1 per cent for each 4 inches in the reed that the goods are narrow. Subtract 2 per cent in this example.

7. From paragraph (1), 105 per cent less 2 per cent equals 103 per cent.

8. Opposite 18s filling, in Table 1, find 1.37 per cent. stoppage due to filling for goods 30 inches wide in the reed.

9. Add the values obtained in paragraphs (7) and (8). 1.37 per cent plus 103 per cent equals 104.37 per cent.

10. 104.37 per cent × $0.01169 (base) equals $0.0122, price per pick.

11. Forty-four picks at $0.0122 per pick equals $0.5298 per cut.

What is the greatest number of picks that can easily be put into the foregoing goods?

Start at 18s filling and follow heavy line to diagonal line marked "Pick Limit for Filling," then follow the straight line to the top of the chart, (see Chart 1) and we get 76 picks. Answer 76 picks, which is the greatest number of picks that can be beat up without any special preparation.

To ascertain if the reed decided upon will be easy weaving. The point of intersection, yarn and sley reed, must be below or to the left of the diagonal line marked "Reed Limit" for the desired threads per dent. (In Chart 1 the "Reed Limit" curves are referred to by reference letters with the values below the caption,—Ed.). for the fore-

TABLE 1.

Per Cent Stoppage Due to Filling.

$$.25 \div \left(\frac{\text{Filling} \times 30}{\text{Width in Reed}} + .25 \right)$$

Width in Reed / Size of Loom	21" / 21"	26" / 24"	30" / 28"	34" / 32"	38" / 36"	42" / 40"	46"	50"	54"
Filling.	Percent.								
1	15.5	17.8	20.0	22.1	24.5	25.9	27.7	29.4	31.2
2	8.42	97.60	11.10	12.40	13.65	14.85	16.15	17.25	18.40
3	5.76	6.73	7.70	8.60	9.50	10.50	11.30	12.20	13.00
4	4.37	5.15	5.88	6.71	7.34	8.04	8.74	9.43	10.12
5	3.55	4.15	4.76	5.37	5.95	6.54	7.22	7.70	8.12
6	2.96	3.48	4.00	4.51	5.02	5.51	6.02	6.48	6.97
7	2.55	3.00	3.45	3.89	4.33	4.77	5.20	5.62	6.03
8	2.27	2.66	3.03	3.43	3.80	4.18	4.57	4.95	5.32
9	1.99	2.35	2.70	3.05	3.39	3.74	4.08	4.42	4.77
10	1.80	2.12	2.43	2.75	3.07	3.37	3.69	4.00	4.31
11	1.64	1.93	2.22	2.51	2.80	3.08	3.36	3.65	3.92
12	1.51	1.77	2.04	2.30	2.57	2.83	3.10	3.35	3.61
13	1.39	1.64	1.89	2.13	2.38	2.62	2.86	3.10	3.34
14	1.29	1.52	1.75	1.99	2.21	2.44	2.63	2.89	3.11
15	1.21	1.43	1.04	1.86	2.07	2.28	2.49	2.70	2.91
16	1.13	1.34	1.54	1.74	1.94	2.14	2.34	2.54	2.73
17	1.07	1.26	1.45	1.64	1.83	2.02	2.20	2.39	2.58
18	1.01	1.19	1.37	1.55	1.73	1.91	2.08	2.26	2.44
19	.99	1.12	1.30	1.47	1.64	1.81	1.98	2.14	2.31
20	.91	1.07	1.23	1.40	1.56	1.72	1.87	2.04	2.22
21	.87	1.02	1.17	1.33	1.49	1.64	1.79	1.95	2.10
22	.83	.96	1.12	1.27	1.42	1.56	1.71	1.86	2.00
23	.79	.93	1.07	1.22	1.36	1.50	1.64	1.78	1.92
24	.76	.89	1.03	1.17	1.30	1.44	1.57	1.71	1.84
25	.73	.86	.99	1.12	1.25	1.38	1.51	1.64	1.77
26	.70	.83	.95	1.08	1.20	1.33	1.45	1.58	1.70
27	.68	.80	.92	1.03	1.16	1.28	1.40	1.52	1.64
28	.66	.77	.88	1.00	1.12	1.24	1.35	1.46	1.58
29	.63	.74	.85	.97	1.08	1.19	1.30	1.42	1.53
30	.61	.71	.83	.94	1.04	1.15	1.26	1.38	1.48
31	.59	.69	.80	.91	1.01	1.12	1.22	1.33	1.43
32	.57	.67	.78	.88	.97	1.08	1.18	1.29	1.38
33	.55	.65	.75	.85	.94	1.04	1.14	1.25	1.33

going goods, the intersection point is below curve D, the "Reed Limit for 3 Threads per Dent," and will be fairly good weaving.

If the number of harnesses and the threads per dent are not the same, then add 1 per cent for each harness over the number of threads per dent desired.

For an example, suppose the foregoing goods required 12 harnesses instead of 3 harnesses with the same reed, then we would add 9 per cent to 106.7 per cent, obtained in the paragraph (3), and the price per pick would be 115.7 per cent × $0.011677 (base) or $0.0135, price per pick, and the price per cut would be 44 × $0.0135 or $0.595 per cut instead of $0.547 per cut as in the previous example in paragraph (5).

Different kinds of and difficult weaves will govern the number of looms that it is possible for a weaver to run; for example, if the weaving was of such a nature that it was not possible for a weaver to run more than two looms, then we would multiply the figures obtained by 14 and divide by 2.

It often happens that automatic and plain looms are operated in the same mill, in which case it is necessary that the weaver makes the same money on both kinds of looms and on the same grade of goods in order to keep peace among the weavers.

Assume that a weaver runs 14 automatic looms with an average production of 75 per cent. Assume that another weaver runs six plain looms with an average production of 85 per cent then by proportion

$$\left.\begin{matrix} 6 : 14 \\ 85 : 75 \end{matrix}\right\} :: 1 : 2.05$$

In other words, you will have to pay the plain loom weaver 2.05 times as much per cut as is paid to the automatic loom weaver on the same grade of goods in order to make their wages about equal. The base price per pick should be raised accordingly.

This proportion between automatic and plain looms is about right for 18s filling, but when heavier fillings are used the production becomes more equal. The following table was compiled from data secured from several mills.

COMPARATIVE TABLE.

Number of looms run, plain 6
automatic 14

Assume that the price paid per cut on plain looms is $1.00, then 16s to 20s Fillings, Auto'c looms $0.50 per cut.

14s to 15s	"	"	"	.49	"	"
12s to 13s	"	"	"	.47	"	"
10s to 11s	"	"	"	.45	"	"
8s to 9s	"	"	"	.43	"	"
6s to 7s	"	"	"	.40	"	"
4s to 5s	"	"	"	.37	"	"

The cause of this variable advantage of the automatic loom is due to the fact that the heavier the filling the less number of yards on a bobbin, requiring more frequent filling of the shuttle which can be accomplished quicker with automatic looms than with plain looms.

It is especially essential to make the proposition as simple as possible for the weaver. To aid in this we post a blue print of the "Price per Pick Chart," an explanation how to use it, a Table of Constants (see Table 2) or percentages figured from the "Price per Pick Chart" for such constructions as are used, and Table 3, with the price per pick all figured for such constructions as are used. We also post a list of prices paid per cut for the different styles that are made.

TABLE 2.
Constants—Multiply by Base.
Price per Pick—5 Shed.—(Cents).

	Warp	Yarn	8s	10s	11²	13	14	16²	17	18²
Width in Reed 38". Sley Reed	80	16								109.55
	81	16.2								109.75
	90	18								111.55
	92	18.4							112.75	
	93.5	18.7								112.25
	95	19			114.75					112.55
	97.5	18.5				114.75	114.75			
					4 Shed					
	62.4	15.6								105.1
	69.6	17.4	110.75							106.95
	74.8	18.7			110.75					108.45
	80	20		110.75						109.55
	81.2	20.3			110.75					
	88	22			110.90					
	88.8	22.2					110.75			
	90.4	22.6							110.75	
	94	23.5							110.75	110.75
	96.8	24.2			112.95		111.1	110.75		
	98.4	24.6						110.75		
					3 Shed.					
Base $.011677 per Dents per Inch.	47.7	15.9							101.25	
	49.5	16.5							102.1	
	59.7	19.3								104.35
	60	20					106.75			
	60.9	20.3				106.75				
	66	22			106.75				106.75	
	70.5	23.5			107.25					
	72	24				106.75	15s			
	72.6	24.2					106.7			
	77.4	25.8			108.75					
				5 Shed—2 & 3 Threads per Dent.						
	74	29.6								118.05
				3 Shed—6 Threads per Dent.						
	77.4	12.9			106.6					
				2 Shed—4 Threads per Dent.						
	86	21.5			108.75					

TABLE 2
Price per Pick—Automatic Looms.

	Warp	Yarn	8s	10s	11²	13	14	16²	17	18²
					5 Shed (cents).					
Width in Reed 38". Sley Reed	80	16								1.280
	81	16.2								1.282
	90	18								1.303
	92	18.4							1.315	
	93.5	18.7								1.310
	95	19			1.338					1.312
	97.5	19.5				1.338	1.338			
					4 Shed					
	62.4	15.6								1.225
	69.6	17.4	1.290							1.250
	74.8	18.7			1.290					1.265
	80	20		1.290						1.278
	81.2	20.3			1.290					
	88	22			1.293					
	88.8	22.2					1.290			
	90.4	22.6							1.290	
	94	23.5							1.290	1.290
	96.8	24.2			1.318		1.295	1.290		
	98.4	24.6						1.290		
					3 Shed					
Base $.011677 per Dents per Inch.	47.7	15.9							1.181	
	49.5	16.5							1.191	
	59.7	19.3								1.218
	60	20					1.247			
	60.9	20.3				1.247				
	66	22			1.247				1.247	
	70.5	23.5			1.233					
	72	24				1.247	15s			
	72.6	24.2					1.245			
	77.4	25.8			1.270					
				5 Shed—2 & 3 Threads per Dent.						
	74	29.6								1.376
				3 Shed—6 Threads per Dent.						
	77.4	12.9			1.242					
				2 Shed—4 Threads per Dent.						
	86	21.5			1.270					

Some mills do not pay by the cut but pay by the 1,000 picks and they put pick counters on the looms to keep an accurate account of the picks. The "Price per Pick Chart" is also a good medium for comparison in such cases, and can be taken care of in the base price. As a comparison with New Bedford's standard price, the proportion is as follows:

Referring back to example (A): What would be the price per 1,000 picks for these same goods?

(Yards—In.) 47 x 36 : 1,000
(R.P.M.) 150 : 175 :: .0081115 : X
(Looms run) 14 : 14

Therefore X = .005593, (base) price per 1,000 picks.
Take the result from paragraph (3), 106.7 per cent × .005593 = .00596, price per 1,000 picks.
58 yards × 36 inches × 44 picks ÷ 1,000 = 91.872.

91.872 × .00596 = .547 per cut, or the same result as was secured in paragraph (5).

The diagonal lines on the chart (shown here on Chart No. 2) are weight constants and can be used to find the weight (yds. per lb.) for any construction of cloth and are convenient for choosing different constructions for the same weight (yds. per lb.).

The rule for figuring the yards per pound is thus expressed:

Take 840 (yds. in a hank) and subtract 9½ per cent, an average contraction of warp and filling, gives 760. 760 divided by [(sley divided by warp yarn) plus (picks divided by filling)] divided by the finished width of the goods expressed in inches = yards per pound. Example:

What is the weight (yds. per lb.) from the loom for 75 sley, 15 warp, 44 picks, 18 filling goods, finished 36 inches wide?

75 (Sley) ÷ 15 (Warp) = 5.
44 (Pick) ÷ 18 (Filling) = 2.45
} Figures represented by diagonal lines on Chart No. 2.

5 plus 2.45 = 7.45
760 ÷ 7.45 = 102 +
102 ÷ 36 = 2.83

Answer = 2.83 yd. per lb.

What is the average counts for the foregoing construction?

Rule: (Sley plus pick) multiplied by width of finished goods in inches, multiplied by the yards per pound, divided by (840 — 9½%) or 760 equals average counts.

75 (Sley) plus 44 (Picks) = 119
119 times 36 (Width) = 4284
4284 times 2.83 (yds. per lb.) = 12,123.72
12,123.72 ÷ 760 = 15.95

Answer = 15.95, average counts.

Another rule for figuring average counts is as follows:

(Sley plus Pick) divided by [(Sley divided by Warp Yarn) plus (Pick divided by Filling)] equals average counts.

75 (Sley) plus 44 (Pick) = 119
75 (Sley) ÷ 15 (Warp Yarn) = 5
44 (Pick) ÷ 18 (Filling) = 2.45
} Figures represented by diagonal on Chart No. 2.

5 plus 2.45 = 7.45
119 ÷ 7.45 = 15.95

Answer 15.95 average counts.

Southern Textile Association.

(*Continued from page* 578.)

stone, of Winnsboro, S. C., was elected to this position by a unanimous vote.

The complete list of officers for the next year, as elected, is as follows:

President, Gordon A. Johnstone, Winnsboro, S. C.
Vice-President, John W. Clark, West Durham, N. C.
Secretary, A. B. Carter, Greenville, S. C.
Treasurer, Marshall Dilling, Gastonia, N. C.
Chairman of the Board of Governors, Jas. A. Chapman, Jr., Inman, S. C.

The following men were elected to membership on the Board of Governors for three-year terms: George M. Murphy, West Point, Ga.; H. K. Hallett, Camden, S. C.; J. F. Long, Douglasville, Ga., and P. J. Clark, Anderson, S. C. The following two men were elected for two-year memberships on the Board of Governors: L. H. Beck, Griffin, Ga., and J. D. MacAuley, Piedmont, Ala.

The report of the resolutions committee was read by Frank E. Heymer, chairman, and was unanimously adopted.

On behalf of the Association, W. M. Sherard presented to H. H. Boyd, the retiring president, the past-president's badge as an emblem of the respect and appreciation of the Association for his services during his term as president.

It was voted that the next meeting of the Association, which will be the regular semi-annual meeting, will be held in Charlotte, N. C., in conjunction with the "Made-in-Carolinas" Exposition which is to be held in that city next September.

Entertainment of Ladies.

It is true that the entertainment of the visiting ladies at the convention has received no previous mention in this story, but it is now a pleasure to record this feature. At 11 o'clock, while their husbands were upstairs discussing pressing problems of the mill, the ladies from out-of-town left the Piedmont Hotel accompanied by a number of Atlanta ladies, in automobiles furnished by members of the entertainment committee, and went for a ride in and around the city. The tour terminated at the East Lake Country Club, where a delightful luncheon was served to thirty-three ladies, and during this luncheon splendid vocal selections were rendered by Mr. and Mrs. C. F. Hoke, two distinguished Atlanta musicians. Returning to the city after the luncheon, the party stopped at a florist's shop, where each lady was presented with a corsage of flowers, which came as a delightful surprise to all. The majority of the ladies were then taken to Georgia Tech, where they joined their husbands and witnessed the Tech-Washington and Lee ball game at Grant Field. The ladies were also guests at the dinner on the Ansley roof garden Friday evening and at the Howard Theatre party which followed the dinner.

On Saturday afternoon those ladies still in the city were presented with boxes of candy by members of the entertainment committee, this concluding a very delightful entertainment scheme for them while they were visiting Atlanta. As one visiting lady expressed it, "Oh, we've had the most wonderful time ever." And in that she evidently voiced the sentiment of every one of them.

Convention Notes.

The absence of Jack Iler was very noticeable at the Atlanta meeting. This is the first time Mr. Iler has missed a meeting of the Association since its organization, and would probably have been present this time, but it is understood he was confined to his Greenville home by illness. His many friends wish for him a speedy and complete recovery.

Another whose absence at this meeting was regretted was Miss Minnie G. Cranford, assistant secretary of the Association, who has reported practically every meeting of the organization up to the present. Miss Cranford was unable to leave Charlotte as she was expecting the body of her brother to arrive from overseas at any moment.

Retiring President Boyd and Mrs. Boyd were among those who remained in Atlanta over Sunday, and they made a trip to Stone Mountain, just outside of Atlanta, which is the largest solid rock in the world. They returned to Charlotte on Sunday evening.

National Association Meeting at Boston

The National Association of Cotton Manufacturers held their annual spring meeting—the 110th convention—at the Copley Plaza Hotel, Boston, Massachusetts, on Wednesday, Thursday and Friday, April 20, 21 and 22. The meeting was marked by a large and representative attendance, an interesting program and attractive entertainment functions.

The First Session

was held on Wednesday evening, with an unusually large attendance, in which were included a number of ladies, in the ball room of the Copley Plaza. Secretary Rufus R. Wilson was first presented by President Russell B. Lowe, who presided at the business meeting, and the report of the secretary was heard. This was followed by the report of the treasurer, W. Irving Bullard, and this report showed that though the shrinkage in business conditions had affected the receipts of the association, notwithstanding it is in a very good financial condition.

Then followed the reports of the several permanent committees of the association, which were read by Secretary Wilson and approved by the association.

The next feature was the annual address of President Lowe, who spoke in an optimistic vein concerning the outlook in the textile field. His address follows:

"The last year, 1920, was one of the most spectacular in the history of the cotton industry, and its lessons should be an important contribution for years to come. It proved that what in the minds of many seemed impossible could happen and did happen.

"1920 started with enormous demands, every machine was employed and prices advanced to unheard-of figures. The universal feeling was that there was not going to be enough goods produced.

"In April the overall crusade started as a protest against prices. At our spring meeting a note of warning was struck against the strained financial condition and the ability to get the prices asked. Soon after this, the so-called 'consumers strike' began and the retailers could move goods only at concessions. This caused a great cancellation and shut-down which began as early as July, and has continued up to the present. The lessons taught as to artificial prices, inventories, value of contracts and the suddenness with which the consumer can act will never be forgotten by the present cotton mill executive.

"The problems of a year ago are still before us, in almost as bad a condition as then. They are as follows:

"Cotton supply, which is over-abundant, and has caused the planter much hardship to mark down and carry, but the under-lying condition of which is not good. The world is billions of pounds of cotton products short since 1914, and to fill this vacancy will call for more and more cotton, but the planter plans for less, which is natural. Indications point to a planting of fifty to seventy-five per cent, but on any such program we are facing a serious future shortage.

"Transportation, the condition of which is no better than last year. The ability of the railroads to render service is better, but their financial condition is bad, costs are more than income, and lack of business, plus their previous difficult condition under the Government, has made the position serious. Many base our ability to recover on the railroads. Their purchasing power is necessary for business revival, but they must make satisfactory wage adjustments before they can buy or induce money to be invested.

"Our New England situation is bad and something drastic must be done. The development of coastwise trade is of first importance. Then, believing that Boston should be a terminal of trunk lines, I personally feel that the Boston and Maine Railroad should be taken by the Canadian Pacific, the Fitchburg Division by the Delaware and Hudson, the New Haven by the Pennsylvania, and the Central New England, with the Willimantic-Boston Line, by the Erie. This would make Boston a terminal for the Canadian Pacific, New York Central, Erie and Pennsylvania, and would allow coal feeders like the Delaware and Hudson to supply our needs.

PRESIDENT RUSSELL B. LOWE.

"Labor in the cotton industry has taken the situation with rare judgment. During the fall it was found that goods were not acceptable to the buyers at existing prices, reductions were made, based on fallen cotton prices, and no profits. These prices were not acceptable, so new prices were made, cutting into the surplus of the companies. In this, labor was asked to bear a 22½ per cent reduction, and it accepted without protest, being a leading example to all other industries. As a result, in most lines orders were received and activities started in January, 1921.

"1920 and 1921 have shown to the public the selfish extremes to which organized labor will go. We had the swing

of the pendulum a few years ago, which proved the selfishness of capital and resulted in the anti-trust laws. The present condition of the railroads and building trades, with the impossible labor organization rules, has aroused public sentiment everywhere, because the public realizes that it stands all the burden. A demand by the public and employers for the open shop has been the result in all parts of the country. The open shop is the only form of employment which provides American constitutional freedom to the public, to labor and to the employer.

"In conclusion, I cannot feel anything but optimistic for the future of our industry, because of the great shortage of products in Central Europe and Asia and the lessened product due to forty-eight hours. We hear a lot about the Golden Rule in business. Our business will stand its application as much as any industry. A few years ago we were delivering goods to the consumer and receiving the least along the whole line of any industry. The thanks we received were articles which pictured the awful conditions of the southern farmer, and the bad condition of textile labor. All textile labor, both farm and mill, were classed as the poorest paid. The only happy group in this chain seemed to be the buyer who could advertise sales at a few cents a yard. The key to this situation is a proper price for goods, which will allow more to go to the farmer and mill labor. Let us work to keep this industry free from a position which will bring on such criticism as we were justly guilty of in the past. Let this industry be the leader in the application of the Golden Rule, and live-and-let-live policy which will cure most of our industrial problems, and will ultimately be the platform on which future American industry will survive.'

The address of President Lowe closed the business session proper and was followed by the presentation of a one-act sketch entitled, "A Cotter's Saturday Night," based on Robert Burns' poem of that title, by the Scottish Musical Comedy Co., composed of a sextette, who rendered a number of old Scotch songs. This concluded the first session which was accorded generally as one of the most delightful occasions of the convention.

The Second Session

convened at 9:30 o'clock on Thursday morning. The subject for discussion at this session was "Problems of Employment and Housing," with John A. Perkins, agent, Harmony Mills, Cohoes, N. Y., as chairman of the meeting. William R. Basset, of Miller, Franklin, Basset & Co., New York City, was the first speaker. Mr. Basset treated upon the relation between employer and employee, and pointed out that in order to be among the fit in the survival from depression, an industrial organization must establish a spirit of cooperation with their employees, and adopt the right kind of an attitude toward the workers. The speaker cited several instances in which disagreements, strikes and similar difficulties were averted by the efficient co-functioning of the two factors—capital and labor.

The next speaker was Robert L. Wilson, of the Westinghouse Electric and Manufacturing Co., whose subject was "Employee Representation in Management." The speaker dealt with the subject from the viewpoint of an experienced mill manager, and declared that employee representation in a plant, though a desirable feature, could not be considered as a cure for all ills; but that the worker had a right to have a voice in regard to working conditions, wages, environment, etc. He further stated that shop committees could accomplish things in a manner impossible to a trade union, though such committees could not prevent industrial disputes. The employees should be consulted in regard to any major changes in an organization and workers should be treated as a part of the organization, he declared. The speaker continued by saying that the workingman, looking at a thing from a different angle, can often see a solution just as clearly as can his employer, and indicated that it is often difficult to get the mill committee to assume much responsibility, inasmuch as they are constantly under criticism from the other workers—their associates.

"Industrial Housing; A Burden on the Textile Industry," was next discussed by Leslie H. Allen, of Fred T. Ley & Co., Springfield, Mass.

At the conclusion of Mr. Allen's remarks, the meeting was turned into a general discussion, which was opened by George M. Dunlop, of John Dunlop's Sons, New York.

Mr. Dunlop opened his remarks by stating that he brought no plan or panacea to recommend to the meeting for the problems of employment and housing. He declared that they have not reduced wages at the plants of his company and that all their mills are running full time. Mr. Dunlop stated that every mill should instill into the minds of its employees the idea of "quality," to make the goods stand out "above its competitors," and to develop in the workers a pride in their output. "I believe the ideal condition is for a manufacturer to know each of his workmen by their first name; to know something about the conditions of their life and to maintain a humanly sincere friendship with them," said Mr. Dunlop. "Insincerity pays small dividends at any time and with the men who work with and for you it is stupid—the certain forerunner of troubles."

Taking up the subject of industrial housing, the speaker declared that the best plan, if any is undertaken, is for a mill to introduce a scheme of housing which would not show one penny profit to the mill. He pointed out that the working man who buys a house on which periodical payments are due necessarily feels that he is at the mercy of the company. Viewed from this angle, he said, it would seem that the manufacturer who builds houses for his help and sells them on a long term mortgage may be sowing seeds of discontent.

Mr. Dunlop gave it as his opinion that if houses are built by the company for the workers, the proper time is when things look darkest and prices are low. Houses built for help on a low market, he declared, will show a reasonable profit in normal times and make a fairly satisfied worker, while houses bought by workers during boom times become a non-liquid asset which in normal times will show a great loss and thus create a very dissatisfied employee.

In conclusion, the speaker expressed it as his opinion that absentee ownership and absentee management is one of the most serious menaces in the present industrial situation. Industry is not something to theorize about; not something with which to speculate; not merely something from which to draw a revenue. It is a condition of service in which a man constantly studies, watches and devises, to get better and better results from a given expenditure of energy expressed in labor and capital.

When Mr. Dunlop had concluded, Capt. William P. White, of Lowell, Mass., addressed the meeting, stating that textile corporations, as such, should not engage in housing operations, but that an independent organization,

separate and apart from the manufacturing business, should be formed for this purpose.

The Third Session

which was the technical meeting of the convention, was held on Thursday afternoon, with a good attendance. This session was in the form of a group discussion, under the auspices of the research committee of the Association. As the first speaker, F. W. Reynolds, chairman of the research committee, introduced Benjamin T. Brooks, of the Mathieson Alkali Works, New York City, who devoted the larger portion of his address to the importance of the organization of research work for a body such as the National Association of Cotton Manufacturers.

Alfred E. Jury, of the United States Rubber Company, was the next speaker, and he discussed standard specifications for and methods of testing cotton fabrics, outlining the remarkable improvement in the manufacture of fabrics for automobile tires during the last decade. He attributed this improvement largely to the technical information obtained by tests of fibers, yarns and fabrics. He also described different methods of testing, etc.

The next speaker was Prof. George B. Haven, of the Massachusetts Institute of Technology, Cambridge, Mass., who has in recent years done some very valuable work in textile testing. Prof. Haven's subject was

The Effects of Moisture on the Tensile Strength of Mechanical Fibers.

His address follows in part:

"With the remarkable advance in mechanical fabrics which has occurred during the last few years, there has arisen a necessity for accurate test methods and specifications. Hence in various parts of the country textile laboratories have sprung up where those various fabric productions which are used for mechanical purposes meet the same exacting tests and analyses that other structural materials are subjected to. While it has long been believed that textiles could never be reduced to an accuracy of strength and composition comparable with other structural materials, the contrary has been proven within the last few years. Many fabrics are now bought strictly upon structural bases. It is, therefore, all the more necessary that tests upon such materials should be carried out with precision and accuracy.

"One of the utmost disturbing elements in the testing of textiles is the presence of moisture. Almost all textile fibers, especially those of vegetable origin, are highly hydroscopic, attracting to themselves considerable amounts of moisture from the atmosphere. The presence of this moisture, the regain, as it is termed, exerts a considerable effect upon the tensile strength of the production. Many fabrics increase from 50 to 75 per cent in strength by the mere presence of natural moisture. It is therefore entirely evident that in order to test textiles thoroughly and in such a manner as to furnish a basis for comparison, the effect of moisture must be taken into consideration.

"Three methods of testing have been widely used. First, testing 'bone dry' or directly from the oven; second, testing in a room where a definite condition of moisture and temperature is artificially maintained; third, testing under the prevailing atmospheric conditions and later entering a correction in the strength of the textile with reference to the amount of moisture in it. The difficulties of the first method are evident inasmuch as a bone dry condition is wholly artificial and is very difficult to maintain. The regulation of a conditioning room is complicated and difficult and there are comparatively few plants in the country where temperature and humidity can be exactly controlled. The third method of correction for moisture is apparently the final solution of the question, since it enables the manufacturer to make his tests speedily and without complicated processes. However, corrections such as the latter must be based on accurate determinations made in textile laboratories."

Professor Haven then showed numerous lantern slides and described the methods used in testing at the Massachusetts Institute of Technology on different fabrics. He explained the different capacities of different fabrics for regaining moisture and showed that different weights and constructions do not all gain in strength in the same proportion due to added moisture, the gain being greatest in the heavier fabrics, and explained the rate of increase in tensile strength with relation of the weight of the fabric.

The final address of the session was presented by Everett H. Hinckley, of Borne, Scrysmer & Co., New York City, on the subject "Necessity of Research in Sizing of Cotton Warps." This address appears upon another page.

Following Mr. Hinckley's address the meeting went into a general discussion of the subjects brought up in the several papers.

The Fourth Session

was opened by President Lowe at 9:30 o'clock on Friday morning. He introduced Frank W. Reynolds, chairman of the medal committee, who made the annual presentation of the association medal for the most distinctive contribution during the year to the devolpement of the cotton industry. This year's medal was awarded to Professor Melvin T. Copeland, of the Harvard University School of Business Administration, as "international statistician and writer on textile subjects."

Charles T. Plunkett, Adams, Mass., chairman of the fourth session, opened the group discussion at 10 o'clock, and presented the first speaker, David R. Coker, of Hartsville, S. C. The subject for discussion was "Production and Sales Problems." Mr. Coker spoke on the needed cooperation between grower and spinner, and suggested the formation of a bureau of spinners to study conditions in connection with present day cotton production and marketing. He also gave an outline of the conditions existing among southern cotton planters, pointing out the situation in which low price cotton places the southern grower.

S. H. Ditchett, editor-in-chief of the Dry Goods Economist, New York City, was the next speaker, discussing the subject of "The Standardization of Textile Products," and giving those present the result of his experience in interviewing jobbers and retailers in various sections of the country. This address was followed by a general discussion. Following Mr. Ditchett, Dr. Hollis Godfrey, head of the Council of Management and Education, Philadelphia, made a plea for a closer cooperation between manufacturers and colleges.

The Fifth Session

was held on Friday afternoon, and President Lowe acted as chairman. Thomas Nixon Carver, professor of economics at Harvard University, the first speaker of the meeting, spoke upon the subject of immigration restriction and employer-employee relations, advancing some revolutionary and impractical suggestions in regard to wages of workers, advocating, among other things, a minimum wage of five

dollars a day for operatives, declaring that at least this as a minimum is necessary to comfortably and decently support a family, and conveying the impression that it was his opinion that unless the textile industry would pay such a minimum, then the country would be better off without it.

Other addresses at this session were "The Interdependence of the Textile and Dye Making Industries," by C. H. Clark, of Boston; and on "The World Cotton Conference," by E. Kent Swift, treasurer, Whitin Machine Works, Whitinsville, Mass., who urged upon those present the importance of that conference and made a plea for a good representation from America.

The final business session convened immediately following Mr. Swift's paper, and the report of the nominating committee, W. Frank Shove, chairman, was read by Secretary Wilson. This report presented the following list of officers for re-election: President, Russell B. Lowe, Fitchburg, Mass.; vice-presidents, James Thomson, New Bedford, and Robert Amory, Boston, Mass.; directors for two years, J. Arthur Atwood, Providence, R. I.; Charles B. Chase, Fall River, Mass.; Grosvenor Ely, Norwich, Conn.; and William L. Lyall, Passaic, N. J. On motion, the secretary was instructed to cast one ballot for the entire list.

Following the election of officers came the report of the resolutions committee, John S. Lawrence, chairman, which was read by Secretary Wilson and unanimously adopted by the association. Among the resolutions passed were the following:

Resolved, That the National Association of Cotton Manufacturers, in convention assembled, favors a tariff in foreign importations which, while assuring needed revenue to the Government, will adequately protect American labor and industries without creating or fostering monopolies. Be it further

Resolved, That we favor for a limited period of years, such special measure of protection as will enable the recently created American dyes industry, while rendering fair and satisfactory service to domestic consumers, to compete on equal terms with the dye makers of other countries, the same to be coincident with a simplification of the administration of the drawback provisions of our tariff laws to the end that American industries shall not be needlessly handicapped in world trade.

It is the manifest desire of the Federal Administration at Washington, and particularly of the Secretary of Commerce, that United States business shall be so organized as to fairly and effectively present its problems and needs to the Government. During the World War the Government was compelled to dictate to industry. During the period of reconstruction, industry can probably materially guide and assist the Government in the assembling of helpful information, and in the direction of its activities. Therefore, be it

Resolved, That the National Association of Cotton Manufacturers in convention assembled, pledge themselves so to organize as to offer to the Secretary of Commerce their sincere and constructive assistance.

Resolved, That the National Association of Cotton Manufacturers heartily approves the aims and purposes of the Foreign Trade Financing Corporation now in process of formation, and that it urges its members to give to the organizers of that undertaking their practical support.

It is reported that the War Finance Corporation is contemplating the Financing of cotton to Europe. Payment for the cotton so exported is to be made either in cash within six months after the delivery of the cotton at any port in Europe, or by shipping to this country the finished products of the cotton to be here sold. The plan further contemplates that the finished product may remain on sale in the United States sixty days if necessary at such price as the European country may determine, but at the end of ninety days all of the goods remaining on hand must be sold for cash, at auction without reserve to the highest bidder. Such sale of finished products of cotton in this market can but be injurious to the textile industry both here and abroad, owing to the fact that much of the product which is made in foreign factories is not adapted to the American market, nor, under conditions as suggested, is it likely to be economically manufactured, and consequently will have to be unduly sacrificed. Therefore, be it

Resolved, That the National Association of Cotton Manufacturers appreciating the fact that an increase of cotton exports not only strengthens our own industrial position, but also materially assists the finances of the countries of Europe, hereby approves the granting of generous credits for the exportation of our raw materials and finished products. Be it further

Resolved, That we do not approve of the proposed plan of payment of cotton exported by the importation of the finished product thereby making this country the dumping ground as such unusual competition would be distinctly injurious and unfair not only to American labor, but also to our textile industry which is now operating at a loss, and at not over sixty per cent. of its capacity or, in a final analysis, an injury to the cotton producer who requires a permament and expanding market abroad, and be it further

Resolved, That any loans made by the War Finance Corporation on cotton should be made with the approval of, but without foreign government guarantee, and as far as practicable such cotton should be destined to specific responsible foreign spinners, who should be made directly responsible for the proper spinning and sale of the products of such cotton.

The financial condition of the Northeastern railroads is serious in the extreme, due partly to the burdened condition in which the properties were returned to private operation by the Federal Government, partly to the so-called National Working Agreements, partly to improper divisions of rates and partly to general business depression. The future life of industry in this section demands a downward revision of transportation costs rather than an increase in freight rate schedules, which would not only fail to return the needed revenue, primarily owing to the diverting of greater quantities of traffic to motor transportation and would gradually stifle our industrial existence. The real solution of the regional problem appears to be solely in the solution of the entire railroad situation of the country. We believe present railroad managements are, in most instances, striving to competently and efficiently operate their properties, but due to impaired credit are unable to secure the financial aid needed. Therefore be it

Resolved, That a further extension of Federal guaranty is in our opinion unwise; that the Interstate Commerce Commission should so arrange divisions of through rates as to compensate each carrier pro-rata to the service performed; that the action of the Railroad Labor Board in Abrogating the National Agreements is sound and wise; that each railroad should so arrange its acts and operations, rates and labor control as to assure adequate service to industry in its section. Be it also

Resolved, That Senator Cummings, Chairman of the Senate Committee on Interstate Commerce, and Congressman Winslow, Chairman of the House Committee on Interstate Commerce, Be requested to give early and full consideration to this resolution and that a copy be mailed to Senators and Representatives of all States having mill members of the National Association within their borders.

Whereas, The railroads in the so-called Eastern District feel the need of revenue so keenly that long established bases of schedules are possible of rupture, and

Whereas, It is proposed to withdraw so-called commodity rates on cotton piece goods and on cotton except proportional rates; to establish a ten class scale of rates advancing rates on textiles; an upward readjustment of the six class rate schedules and a very evident strong movement toward a mileage scale of rates, and

Whereas, A mileage scale of rates will either stifle the textile industry in the Northern and Eastern States or force it to locations nearer raw material or finished goods markets, be it

Resolved, That the Committee on Rates and Transportation be given the unanimous support of this Association, in convention assembled, in its endeavors to solve the problems of the textile industry in the so-called Eastern District.

The banquet of the convention was held on Friday evening in the grand ball room of the Copley Plaza, and for the first time in the history of the association there were ladies—quite a number of them—present at this function. Music was furnished by the Copley Plaza orchestra, and singing was enjoyed under the leadership of Albert E. Brown, who was assisted by Charles H. Ely and Stephen C. Lowe, alias John Philip Sousa. President Russell B. Lowe acted as toastmaster.

The first speaker of the occasion was James S. Alexander, president of the National Bank of Commerce in New York, who took as his subject, "The Basis of Better Times," declaring that the rebirth of normal business awaits a new attitude of man toward his job. Correction of the business and social confusion of the time must be sought, he urged, not only in technical banking and business adjustments, but more particularly in the human element, which has set free great forces that must be brought under control before business can again be on a sound basis.

Mr. Alexander gave a general review of business and economic conditions, and expressed it as his opinion that it will be only a matter of time and hard, earnest work to readjust business conditions, the worst of it being now over.

Declaring that it is a question of the personal attitude of man toward his job which will change conditions, the speaker said that too many people today hope and expect something will be done for them, while their interests would best be served by their doing a full day's work for their pay. There is an effort on the part of workers to retain the advantages won during the abnormal war period of shorter hours, higher pay and easy work, said Mr. Alexander, regardless of the present lack of an economic basis for the continuance of such conditions. He declared that the fundamental principle of enlightened labor leadership today should be to inculcate a return to the doctrine of an honest day's work for an honest day's pay. Inflated wages and the non-competitive conditions of the war and the later boom period produced inefficiency and irresponsibility, he said.

"It is essential to the welfare of labor itself to banish this attitude," continued the speaker, "not because individual efficiency and a full return of value received in the pay envelope means bigger profits for the employer, but because they mean better times for the workers themselves. Workers cannot, in the long run, consume more than they produce. If wages are too high in relation to the exchange value of the product, wages must come down. Further, employers must not seek to drive wages below their true value. There is this reciprocal personal responsibility involved in the relation of workers and employers—on the one hand to render efficient service for every dollar demanded, on the other to render over to labor every dollar earned."

Referring to the cancellation evil, Mr. Alexander said that in years past there have grown up customs that made easy a large percentage of the cancellations that characterized the business reaction. The responsibility for this does not rest entirely with the buyer, declared the speaker, for usage in many lines of business contemplated that a contract of purchase was not binding if it became inexpedient to keep it. As a remedy, Mr. Alexander urged that the structures of business will be materially strengthened if it becomes the opposite tradition of trade that contracts are made to stand by. Business is seriously retarded today by the unwillingness of manufacturers to accept orders for distant deliveries through fear of cancellations should a further drop in prices come, Mr. Alexander declared, and this because of the heretofore accepted standards of commercial conduct which permit cancellation at will. The temper of business, and the accepted methods of conducting it, should be such that we shall never again witness such a wholesale repudiation of business obligations, said Mr. Alexander.

Continuing with emphasis upon the human aspects of business and the maintenance of personal factors of strength as the most practical pathway out of the business and social confusion of the times, the speaker declared there must be a stiffer moral fiber in business, a correction of elements of weakness in the conduct of business and a getting away from the lax methods and extravagance and carelessness brought on by war and post-war conditions, that there must be a building up of a higher consciousness of personal responsibilities. He also stated that through an elementary personal weakness, nations are rendering financial stability impossible by continuing efforts to maintain the military advantages won in the war, or to evade the just penalties thereof. The prime test of the future, he said, for men as citizens and for nations as members of world society, will be the ability to conduct the affairs of life on the highest standards of personal and social responsibility.

"A return of social stability rests upon recognition by both nations and individuals that reconstruction can come only by hard work," said Mr. Alexander in conclusion, "that business can endure only on the basis of a sincere discharge of obligations, whether they be in the form of executive duties or in the form of a day's labor and that a high sense of personal responsibility must prevail in all the relations of life.

"The most frequently asked question of the day is when we may expect a return of normal business. Forecasts based only on technical business considerations are worth little. The rebirth of normal business awaits a new attitude of man toward his job."

Dr. Charles T. Baylis, of Brooklyn, N. Y., traveler, author and lecturer, was the final speaker of the evening, following Mr. Alexander. Dr. Baylis spoke on the subject of "Americanism Versus Radicalism," and made an appeal to those present to awaken to the danger of socialism, anarchism and other forms of radicalism in America. He declared that if a man is not ready to be loyal to the American flag, then he has no right to live under its protection, and urged the awakening of the moral, patriotic and spiritual passions to save the country from the teachings of bolshevism, socialism, etc. He took also to task those who through fear of going too far in the suppression of free speech allow radicalism to flourish among them, and in conclusion, paid a tribute to the American flag—the fulfilment of the ambitious dreams of the lovers of liberty in every age of the world, and God's best gift to man since Christ died to make men free—Old Glory.

Necessity of Research in Sizing Cotton Warps.

BY EVERETT H. HINCKLEY.*

It is doubtful if in the manufacture of cotton cloth there is any process the actual cost of which has so remote a relation to its value in terms of production, as does the slashing of warps.

The organization of the mill may be such that the cotton passes through the usual stages in the preparation—as picking, carding and spinning, with no undue amount of waste. A uniform yarn (at least such as current practice considers uniform) may be produced, and yet, on account of improper sizing of the warp, the advantages accruing from careful yarn manufacturing may be largely nullified and the weaving department operated with difficulty and at a great disadvantage. Although the overseer of weaving and his assistants may do their best, they cannot overcome such adverse conditions. Adjustment of the tension on the warp in the loom, the temperature and humidity of the weave room, will, up to a certain point, help to remedy this condition, but by no means offer a cure for it. As a result of these conditions weave-room production drops, seconds increase and operators grow dissatisfied. The increased cost of weaving and the loss of output may easily amount to several times the entire cost of slashing.

Important as slashing is, it is frequently regarded by the management as an operation of minor importance and does not receive the attention that it should. For this situation there are several reasons: For example, the process of slashing involves the use of hot, sticky liquid and is, therefore, not always neat in its application. To overseers with a mechanical or systematic turn of mind, such conditions do not appeal greatly. Again, the starch and other sizing materials are altered in form and general appearance before being applied to the yarn and this alteration is not easily followed by the eye. Casual critical observation by the superintendent or overseer will not disclose whether the size mixture is correct or not. In this connection the word of the slasher tender or the size mixer must be taken and very little opportunity is offered whereby his word can be readily checked. The above conditions are indirectly recognized in that most mills do not pay their slasher tenders on a piece-work basis in order to avoid undue hurrying of this work.

*Borne, Scrymser & Company, New York.

The process of slashing compared with that of spinning or weaving is very rapid and therefore any error in judgment of the operator thus extends over a considerable quantity of his product and results in a corresponding amount of damage before correction can be made. In fact, some of these faults—for instance, stains caused by materials in the sizing mixture added to facilitate the weaving of the warp, may not be found until the goods are dyed and finished. Again, as the warps are usually not all put into looms at once, the extent of the damage is often not realized for several weeks or months; hence, by the time the seriousness of the situation is realized it is often too late to apply measures that would correct it. In short, in the slashing process there are certain controlling elements, largely in the hands of the slasher tender or his overseer, which directly and in a large measure affect the payment of dividends.

When this condition is realized, it would seem that sufficient efforts should at once be made to obtain some definite and concrete information bearing upon the conditions of sizing and then to establish those conditions under such a system as to make it practically impossible to deviate very far from them. That this is not generally done is a well-known fact. The underlying reasons for this condition doubtless are largely influenced by the fact that it is so difficult to carry out tests that will demonstrate without question just what the best conditions are. In fact, frequently, the results obtained in practical mill tests are such as to render negative certain facts based on experience over a long period of time. That is, taking it as a whole, a weaver may produce certain results over a limited period covering which the conditions of sizing are known. Yet, when a different test is made on a warp or series of warps, sized under apparently the same conditions, the results of these different tests may or may not coincide with previous experience.

To my mind the above conditions reflect the fact that such investigations do not take into consideration the real causes for difficulties in weaving. For instance, a careful study of cotton yarns will show that they vary greatly in size, over short distances, as high as 50 per cent even of the highest grades; that they also have a corresponding variation in strength is well known by any one who has made or studied the results of tests of yarns for tensile strength. Other faults commonly met with are knots, bunches, and coarse threads due to improper spinning.

The object of sizing is, therefore, to furnish the weakest yarn with sufficient strength to stand the action of the loom, harness and reed, and likewise give to the soft spun parts of the yarn more strength, laying the bunches and cementing to the yarn the loosely bound fibers in such a manner that they will not readily chafe into such shape as to offer resistance in passage, particularly through the reed. In attaining this end, of course, the yarn must still remain sufficiently supple to pass through these operations and interweave with the filling to form a proper face. As suggested, some of these faults may be practically impossible to cure, but they can all be helped. Coarse threads may originally be so weak that no amount of starch paste will stick them together sufficiently to weave well. Bunches may be small and pass through the harness without breaking and then break back of the reed in the shed, causing considerably more difficulty than if they had broken back of the harness. Knots will always present great difficulties, especially spinners, the firm sizing of which only increases the difficulties in the loom. Due attention to these points when judging the results of the warping-weaving test would, I believe, help materially in the deduction of useful facts.

The process of slashing is, of course, well known to you all and it may be a case of bringing coal to Newcastle in reiterating again the conditions affecting its successful operation. These conditions are:

1. The nature of starch used.
2. Nature of "sizing compound."
3. The method of cooking the sizing mixture.
4. Method of applying the sizing to the yarn.
5. Condition of drying.
6. Mechanical condition of the slasher.

Of the starches available practically all have been used to a greater or less extent for sizing. In a general way the mills making finer and more difficult cloth goods have come to accept potato starch as the most useful, while those making coarser and less difficult kinds of cloth goods claim to get proper and satisfactory results from corn starch. Thin boiling corn starches have been introduced and are used where thick boiling corn would not do, or to replace potato starch. Practically all commercial starches are in a high state of purity and contain, outside of a fractional per cent of only natural oils, gelatinous matters, fiber, and water. Mixtures of various starches are seldom met except when made for a particular effect, and are easily recognized by the microscope. The amount of water they contain is variable, depending somewhat upon the conditions of moisture in the air. Particularly is this so in relation to potato starch. This varying moisture may easily reach such proportions as to cause serious error where the starch is added by weight to the sizing mixture, thus producing different results in successive mixings supposedly made by the same formula. Along this line there is certainly need of investigation that will reveal some simple method whereby a slasher-man may be always sure that he is adding the same number of pounds of carbohydrate to his batch. A simple and practical way of meeting this difficulty is to measure the starch by volume instead of by weight, but this cannot always be applied, especially if the starch is in the pearl form and varies in the size of lumps. The varying properties of the starches themselves, particularly after pasting, offers food for thought and doubtless has a great deal to do with the particular results obtained on the yarn. That these pastes are essentially very different from each other is easily shown by microscopic examination. The investigation of starches and their proper operation for a specific purpose in connection with slashing offers a very wide field.

In selecting a "sizing" compound, a cotton cloth manufacturer has certainly a large number of materials from which to choose. By a little investigation it will be revealed to him that these "sizing" compounds consist essentially of the following ingredients:

(*a*) Fats, such as tallow or cottonseed oil.

(*b*) Soaps made from animal or vegetable fats.

(*c*) Chemicals, such as magnesium chloride, acetic acid or caustic soda.

(*d*) Adhesives, such as dextrines, vegetable or animal glues.

Most of the compounds offered do not belong in any individual group, but consist of a mixture of the ingredients of several groups. For instance, perhaps those most com-

(*Continued on page* 623.)

Georgia Manufacturers Meet at Athens

The sixth annual convention of the Georgia Manufacturers' Association was held at Athens, Ga., on April 13th and 14th. While the attendance did not equal some of the previous annual meetings in the number present, the 100 or more who did attend were full of optimism and the program and entertainment features, in the hands of capable officers and committees, went off with a snap that gave no time for dreaming about changed conditions.

Calling the convention to order at 10 o'clock Wednesday morning in the Chapel of the University of Georgia, President Baker introduced Dr. Walter Anthony, who gave the invocation.

Following the invocation the president introduced Mayor Andrew C. Erwin, of Athens, who delivered an address of welcome.

Mayor Erwin brought forth smiles, laughter and cheers when he gave a comparison between the "good old days" and the present time. "It used to be," the mayor said, "when you wanted to come over to Athens, or any other place, for a convention, you called the foreman of the plant before you, outlined a specific program to be followed in your absence and left home with the feeling that this work would be carried out.

"However, the times have changed. With us politicians and the labor unions running your business for you, you go to the foreman, ask his humble permission to go over to Athens for a couple of days to attend a convention. Then he asks you if you are sure you will do nothing detrimental to his welfare, or the welfare of the union, while there. If you promise this, you may go."

PRESIDENT W. B. BAKER.

Chancellor D. C. Barrow, of the University of Georgia, was next introduced. Mounting the platform, very much at leisure, looking over the assembled manufacturers, and a large number of students who attended the session, Mr. Barrow said:

"I'm very glad to have you come and look over your property. I hope you see that it needs lots of improvement."

Waiting for the laughter to subside, the Chancellor continued, "I'm very glad to have you in our city—in fact, I'm always glad to have anyone here that will listen to me speak."

He then outlined the history of the famous old chapel which was built in 1832, and impressed the visitors by a brief pause after saying, "What a wonderful story, what wonderful speeches, what wonderful and impressive assemblies these old historic walls would tell of—if only they could speak."

Professor Barrow, after outlining a great many needs of the University of Georgia, and other colleges throughout the state, to properly care for and educate high school students who wished a college education, stated, "Gentlemen, we need you now, but feel confident that you will need us, and our education of the coming citizens, far more than ever we need your backing, support and cooperation at the present."

He also gave an interesting talk on how socialism, I. W. W.'ism and other "isms" were outgrowths of the lack of proper education of the classes. "They have got to have an understanding of how things should be done," said the Chancellor, "and they can't get understanding without education." In this talk he pointed out how the manufacturers would need the products of the colleges in maintaining efficiency, and overcoming the socialistic tendency prevalent throughout the country today.

A. D. Schofield, of Macon, Ga., responded to the addresses of welcome in the absence of W. J. Pierpont, who was late in arriving in the city. Mr. Schofield recalled the days of "Old Athens" and stated that he was very pleased to note the progress made during the past years, and voiced the heart-felt appreciation of the association for the warm welcome given them in this city.

President Baker followed this response with the annual report of the association, being followed by Secretary John W. Yopp, who gave the report of the secretary and the report of the treasurer in the absence of H. E. Watkins, the treasurer.

In addressing the association after his first year of service, President Baker spoke impressively of prevailing conditions, saying in part:

President Baker's Address.

When 1921 was ushered in it is probable that every manufacturer heaved a sigh of relief because 1920 had ended. And yet, the past year, despite all the trials and tribulations it brought us, was rich in experience which we should capitalize in the current year and throughout many years to come. It is to be hoped that manufacturing interests will profit by the lessons of 1920, because in proportion to the amount of our intelligent application of these

lessons will we lay the foundation for future progress and prosperity.

There is no more broadening influence than the mingling together in conferences, meetings and conventions of those engaged in manufacturing pursuits, and nothing that benefits us so much as to discover that our troubles—both real and imaginary—are common to our fellow-man, and that the problems of the day are solvable. A mutual pull-together, thoroughly analyzing the problems confronting us, will help turn the corner where we hope to find a reward for our efforts.

Since the last annual gathering of the Georgia Manufacturers' Association in Macon we have faced unusual conditions. Cool, deliberate thinking has been more necessary than ever, to meet the tension of readjustment through which we are passing. Perhaps the one outstanding source of satisfaction coming out of the entire year is the federal political situation, now settled for four years.

Federal, state and municipal politics have been left almost entirely in the hands of political organizations and other organizations seeking selfish advantages. May I not strongly urge you to take an interest in the election of men to run our several styles of government in the future and to advise with and help those who are representing us today, in order that they may get the business man's viewpoint, which is so obviously needed.

Our governments are nothing more nor less than big business propositions requiring large sums of money, and they should be run on the same basis as any well regulated business organization.

Reconstruction has tightened the industrial situation to a considerable extent. The most serious of our difficulties seem to grow out of disorganization and distress in Europe. One of the brightest stars on the horizon of the present situation lies in the fact that we are the strongest nation on earth, financially, and it must be recognized that a revival of American business does not depend upon a complete solution of European problems.

Seldom has there been such a need for goods on the part of the consumer as exists today. And it is equally true that there has never been such a surplus on hand as now. The consumer hesitates to buy at prevailing prices. The chief obstacle to business improvement seems to be an unwillingness to look the facts in the face and a reluctance on the part of individuals to assume an inevitable share of the economic losses.

Stagnation of business in agricultural sections brings home the vital truth that farming is a most important business in Georgia, and thought of the farmer's troubles is not a class proposition, but a matter of great industrial concern. A clear realization of this fact on the part of the manufacturers of Georgia will help the situation immensely. The millions and millions of dollars invested in manufacturing plants of Georgia are in a large degree dependent upon the farmer and the soil furnishing the raw materials for finished production. By encouraging and assisting the farmer and advising with him, closer friendship is made and new wealth for development of greater agricultural and industrial resources is created. Efforts along this line will bring forth fruitful results for your community and the entire state. Advocate among your farmers greater diversification—1st, raising food necessary for their own consumption, and, 2nd, for the purpose of supplying the towns and cities of Georgia. The cities buy all of their food from some farm.

If this food is shipped from some other state into Georgia we not only pay the transportation charges, but also several middlemen's profits before it finally reaches us. And the worst of all we lose the wealth to our state by paying out money instead of receiving it. Therefore, the loss is greater to us than simply the sum paid—it amounts to the sum paid plus that we might have received.

Georgia should have a home building and loan system, through the medium of which the wage-earners are placed within easier reach of home ownership with payments made upon a plan of installments especially designed to conform to their earning capacity. A home-owner makes a good citizen and a loyal and efficient employee. The law protecting this class of investors should be so framed as to give a maximum of protection.

The industries of our state have been suffering from too much legislation and proposed legislation. Government interference with the ordinary processes of business has had a harmful effect. Such regulation and control is against every economic law and every principle of American institutions since the foundation of our government.

Truly we need "less government in business and more business in government." Strict adherence to the principle of supply and demand is the only path that leads on to progress. Natural laws cannot be evaded by artificial restrictions.

Georgia needs a system of education that will make every child an intelligent citizen. Instead of the state being 43rd in the Union from an educational standpoint it should be up near the head of the list. The manufacturer owes a profound duty to the state in taking an active interest in better schools.

Freight rates are up to a point that is having a marked effect upon business. Industries can bear just so much in the way of transportation charges. Bed-rock of the railroad situation must be reached. The waste must be eliminated. Recent experiences have shown that the freight rate load is too heavy for shippers to carry. This is reflected in the growing loss of tonnage to the railroads. Manufacturers will find it time well spent to give time and consideration to the problems of the railroads. They are to commerce what the arteries are to the human body. Fairness must prevail to the carriers, shippers and railroad employees alike. No other plan will make for the prosperity and development of the resources of a section or the entire country.

The unemployed situation furnishes a problem. Wage reductions are inevitable and are being scientifically established on present prices of the particular commodities manufactured and on the reduction in the cost of living. Industry goes forward just in proportion as employers and employees are fair-minded, considerate and constructive. Individuals are rapidly finding out that when one hand is stretched out with a demand the other hand shall hold an offer of equivalent production.

Recent developments coming out of the activities of Secretary of Commerce Hoover, are encouraging and indicate an improvement in southern conditions through the medium of the War Finance Corporation by moving cotton. This and other things are visible signs and it is not believed that the "worst is yet to come" but, on the contrary, these developments justify the belief that we have passed through the greatest part of a serious depression.

In conclusion, gentlemen, my suggestion is intelligent

work, production and distribution, which will solve our problems.

At the conclusion of the president's remarks, he introduced F. E. Land of the Georgia State Board of Vocational Education, who spoke on his experiences with industrial rehabilitation.

In the absence of R. S. Parker, general counsel of the association, his paper on "Legislative Tendencies" was read by Secretary Yopp. This paper concluded the morning session.

At 1 o'clock the delegates were entertained at luncheon at the State Normal School, members of the Domestic Science class preparing and serving the food, while about 40 Glee Club girls under the direction of Miss Liebing rendered song hits with orchestral accompaniment. President Jare M. Pound of the School spoke briefly.

After a most enjoyable luncheon the delegates returned to the meeting hall for the afternoon session. About this time a self appointed committee began work collecting donations for a candy fund for the benefit of the young ladies of the student body who participated in the entertaining of the manufacturers. This work was entirely successful and the committee "delivered the goods" on the campus to about 70 girls amid vociferous cheers for the manufacturers.

At the afternoon session Col. B. L. Bugg of the A. B. & A. Railway discussed the railway situation and pointed out a number of interesting facts about the Railway Labor Board.

The only other speaker at the afternoon session was Jos. A. McCord, chairman of the Board, Federal Reserve Bank, Sixth District, who told of the work of the Federal Reserve System.

The evening was devoted to an entertainment by the University of Georgia Glee and Mandolin Clubs at the Colonial Theatre, where the manufacturers were the guests. At this point it was found that the self appointed committee on candy had somewhat exceeded the speed limit and not only had prevailed upon President Pound of the Normal School to allow the girls of the Glee Club and Domestic Science class to attend the concert but had also arranged that they go with the manufacturers as their guests. As there were several "girl shy" manufacturers and about 120 girls present, the remaining members were well supplied. Former Mayor Pierpont of Savannah tried to claim all girls from his home city and Mr. Schofield of Macon seemed to have similar designs, but the writer was so fortunate as to deprive each of these worthy gentlemen of one representative lady. It was perfectly proper that Atlanta should entertain Savannah and Macon anyway.

The girls came to the theatre in a body accompanied by President Pound and a number of teachers. The manufacturers had a delightful evening and a volunteer chorus, led by Col. Fred B. Gordon of Columbus, sang "Good Night, Ladies" as the cars bearing the girls drifted away into the darkness.

Thursday Morning Session.

A heavy shower on Thursday morning sent the delegates on a search for coats and motors, but shortly after 10 o'clock the meeting was opened and Stephen C. Mason of Pittsburg, Pa., president of the National Association of Manufacturers, was introduced as the first speaker. Mr. Mason spoke on "Industry" and said in part:

I wish to speak to you concerning some of the many industrial affairs and problems which are now pressing for settlement and present a brief summary of the conditions confronting us. Let me say right here, that the proper solution of our industrial problems today is more dependent upon the organized effectiveness and influence of the nation's business men than ever before in our history. Organized industry must formulate its own program and make its collective voice heard in no uncertain tones or the elements of discontent and destruction will succeed in grafting into our body politic many dangerous and un-American doctrines.

Under the systematic cultivation of a handful of men who are fostering in the minds of our labor elements many vicious and un-American notions, we have progressed from that condition when small groups were organizing to protect their alleged "rights," to a period in which the word "rights" has been supplanted by the words "demand," "privilege" and "advantage." The nation the last several months has been in the throes of that destructive industrial-economic disease known as strikes. The strike of the policemen in Boston, the steel strike and the coal strike and the switchmen's strike have shown the length to which organized labor will go in an attempt to accomplish its ends.

I believe every good citizen will agree with me when I say that these and similar actions have demonstrated that the time has arrived when organized labor in the United States had better take stock of its policies and practices from a thoroughly American standpoint. The American people are no longer going to accept lip service from those organizations in our midst which have been leading the nation to the brink of the most serious economic and social crisis in our history. Oft repeated declarations of Americanism and patriotism and frequent disclaimers of Bolshevistic beliefs are not sufficient to conceal their constant efforts to stimulate unsound and dangerous industrial theories. The only truly American standard, with equal opportunity for all, and special privileges for none, is the "open shop."

We meet at an hour of most vital importance. Our industrial future is dependent upon the method and purpose which moves those in charge of national affairs in solving the present critical problems. Taxation, immigration, industrial relations, transportation, foreign commerce, domestic production—these are the principal and fundamental issues urging themselves upon our people for consideration.

I urge upon you business men, as well as all thoughtful citizens, that you give immediate attention and assistance to our lawmakers and other factors in working out a sound and thoroughly American solution. At the same time I would warn against permitting these grave national problems to be handled solely by those who have mainly a selfish or political interest in the result to be achieved. There never was a time in the history of the United States when the thoughtful consideration and practical wisdom of business men was more needed to assist in the successful solution of the economic issues now pressing upon us. Mindful of this fact, the National Association of Manufacturers, representing more than 5,800 of the largest manufacturing institutions in all sections of the country, has given and is now giving its best efforts toward aiding in the practical working out of a program which will conserve the true welfare of all the people and the safeguarding of our

industrial prosperity and development.

Another problem of paramount importance is that of immigration. Instead of arbitrarily stopping all immigration I believe we should raise the standard of admission.

The action of the government for the deportation of undesirables is to be commended. It is the only punishment that fits the crime of anarchy, sedition or revolution by force, and the government should continue this activity until the last one of these pests has been sent back to the country from which he came.

The American people can change the form of their government whenever a majority permanently and deliberately is of the opinion that it ought to be changed and has made up its mind what form the change ought to take; but, in the meantime no man is fit to live here who does not wish to live here under those conditions. Physical, mental and moral fitness for citizenship should be the test of admission to the nation. The criminal and the degenerate are not distinguished by the test of language. The determining factor should be a man's capacity and qualifications for citizenship in a representative republic; those who aspire to that privilege we desire, those who would destroy it we should neither invite nor allow to remain.

We have all experienced the burden and vexations incident to making our Income Tax returns under the present complicated system of Federal taxation law.

With the rapidly vanishing and diminishing income upon which taxes may be levied in accordance with the existing statute, it will undoubtedly be necessary to make radical revisions therein in order to provide the necessary revenues for the expenses of the Government.

One of the simplest forms of taxation that has ever been devised, requiring the least accounting burdens on the payer thereof and also operating to distribute the taxation in the easiest possible method upon the ultimate consumer, is that of a direct sales tax to be collected and paid by the seller.

We are urging upon every state manufacturers' association the enactment by their respective legislatures of statutes specifically requiring voluntary associations to establish legal responsibility and the right to sue or to be sued. Such legislation has been adopted in New York, Connecticut, Minnesota and Michigan, and we believe should be enacted in all other states.

Why is this opposed by labor leaders when it should do so much toward inspiring greater confidence in trade unions and take away one of the principal objections to dealings between employers and unions—that of the making of a contract between a responsible and an irresponsible party? A contract that cannot be enforced on both parties is a farce.

Let our industrial slogan be—to meet organization with organization and see to it that none but Americans are placed on guard. The bugle call of Americanism is sounding; it calls to all patriotic Americans to stand together:

To maintain inviolate the Constitution so wisely framed by our forefathers;

To protect and defend the principles of liberty, justice and humanity;

To foster and perpetuate the institutions that have developed under our concept of representative government, and make America safe for Americans.

The next speaker on the program was the Hon. S. J. Slate upon the subject "Administration of the Georgia Workmen's Compensation Law." Mr. Slate represents the employers on the Georgia Industrial Commission administering the Act, and he spoke in part as follows:

Workmen's Compensation Law.

Compensation is really a legal contract between employer and employee, a substitute law for common law action. When the law went into effect in this State, or at least when the insurance rates were promulgated, there was considerable complaint as to the rates; and I have felt sometimes that possibly the best service that I could render the manufacturers in Georgia would be to so assemble the statistics of our Department, so segregate industries and premiums and awards—in other words, have on one side the amount of premiums, we will say, received from a certain industry in Georgia, and on the other side the awards and the compensation, the medical attendance and expenses connected with it—so that there may be presented at future hearings, both before the Rating Board of the different insurance carriers in this State and before the Insurance Commissioner of Georgia, who has full authority to make these rates, a concrete example of the fact that these rates are too high, or that they are adequate and that they are just.

I don't know whether you gentlemen have ever contended with the actuaries of Insurance Companies. Among the first complaints that came to this commission, or rather came to me upon the commission, came from the yarn mills of Georgia, who were given a rate of 66 cents; on the other hand, the spinning and weaving rate in Georgia was made 44 cents. Fortunately a great deal of statistics had been collected by other industrial commissions, to which we had access. After taking up the rate with the Rating Bureau, and after considerable work upon the rate, that rate was finally reduced to 44 cents, the same thing as the spinning and weaving rate, and that rate has been promulgated in this State, retroactive to the last day of March, the date the Act went into effect. That's the only concrete example of anything we have been able to accomplish. We have assembled statistics, and are in the process of assembling statistics, on a great many industries.

The insurance men will talk to you considerably about surveys, and experiences, etc., reducing your rate. I want to talk to you a little this morning about how employers can cooperate with the Industrial Commission in helping us so far as the examination of your plants is concerned. I am not a mechanical engineer. It is left to the judgment of you gentlemen as to whether or not safety appliances are worthy of your consideration and installation. In other words, that is a matter that the individual plants must determine for themselves. I would say to you, however, that in all investments for safety appliances, with the view to reduction of rate, try to see that whatever investments you make may be of a permanent character, that will sustain you and will enable you to obtain this reduction for a period of years.

I would say that the ordinary accidents, the ordinary cuts, the ordinary things, that come up around plants, that taking form 15 would thus obviate the doctor's report that you make and would be first aid. A great many of the plants have a nurse; let her use the iodine and other necessary things at first. We show today an expense in our initial month of over $1,800 for medical attention, in which the employee never left work, and was working upon the day he was injured. I speak to practical business men,

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who know that if 25,000 or 50,000 such cases come in in a year, that amount must necessarily be returned to the insurance carriers in the shape of premiums.

Another way in which you can help—and I would like to call your attention to this just because the State seems to be laboring under an embarrassment—is on accident insurance. All the accidents, for which employees are compensated, must arise out of and in the course of the employment. If you buy an accident policy, it protects you anywhere, but these accidents must occur upon the employer's premises, or upon some of his work, and the injury be directly traced to his employ. So when these claim agents come around, you want to pay your employees every cent to which they are legally entitled, and we want to construe the law as liberally as possible, but still if that is to be a charge upon industry, only the accidents for which industry is liable should be charged.

There is another right delicate thing in the administration of the act. On the question of dependencies be sure that your compensation, when a claim is made, is paid to a dependency that is legally entitled to it. I desire to say here that the law of this State, and the law of every state in the Union, will not permit the payment of compensation to men who are living with women in adulterous relations; and the question of dependency must be clearly and legally proven. Then the question of a man's living with his wife, and the question of children under eighteen, which are set forth in the act, and all other questions must be clearly proven.

M. E. Dyess (Augusta):—I would like to ask one question with reference to Section 14, which provides that under certain conditions for injury of an employee through gross carelessness on his part no compensation is allowed. Suppose there is an emergency arising in a case like that. I understand from a humanitarian standpoint that has to be taken care of, but where is the liability, if any emergency treatment shall occur. The Section says in substance that no compensation shall be allowed for any injury or death to an employee, where inflicted by gross carelessness, or where intentionally self-inflicted, or inflicted by a refusal to use safety appliances. Now suppose we have a man dangerously hurt. He must have attention. From a humanitarian standpoint we would take care of him and that would be an expense. The insurance does not work that. Where do we stand in a case like that?

Mr. Slate:—Well, I would say very frankly that that expense of the employer, if the employee cannot pay it, would fall upon him. I think that all of those questions will be settled when they come before the Commission. When they come before the Commission we will attempt to take into consideration the question of the liability, etc. Of course, when it comes to allowing compensation beyond the necessary expense, it would not be allowed.

Question:—Is it necessary for the employer to file proof of insurance with the Commission?

Mr. Slate:—No. sir. I am glad you asked that question. There are two methods of carrying insurance. One is self insurance, in which the employers must make application to the Commission and we grant them a certificate of self insurance. We require every insurance carrier to file with us the number of the policy, the name of the assured, and the amount of the premium, and in case that insurance is carried with an insurance carrier, he files the proof with the Commission. Only Form 15 is required of the employer by the industrial commission, the first written report to the Commission. All other forms can be executed before the Commission by the insurance carrier representing you.

Stephen C. Mason (Pittsburgh, Pa.):—Have you had any difficulty in determing in case of hernia whether it was an old disability or a new one? That has arisen in some other states.

Mr. Slate:—Yes sir; we have had some difficulty. I suppose we have had as much difficulty in those things as most other states. We have had his doctor to tell us that it was new, and we have had the doctor for the insurance company to insist that it was not produced by the accident, and then we have sent the doctor for the Commission there, and we have generally taken whatever Dr. Roberts, who acts as our doctor, has stated about the matter.

We have had this difficulty to arise. I had it up the day before I left Atlanta. We find some parties; in fact, we did have a negro there who didn't want to go back to work. The insurance carrier's doctor insisted he could, and his doctor said he could not, and our doctor said he could, and we stopped compensation on him the day I left for the convention. I mean by that that we generally go, as you would naturally understand, by the recommendation of our own doctor.

Question:—You mentioned something about making improvements to prevent accidents. We have an agent to come to our plant, and no matter how completely we carry out his recommendations another one comes along with other recommendations. One comes along and makes a series of recommendations, and the next one comes along and says he was all wrong and the recommendations are not standard. I would like to find out if there is any way to tell what is correct?

Mr. Slate:—We are trying to arrange that now. We are taking up this question with the American Society of Mechanical Engineers, and we wish to take up with the rating bureau later, the question as to what credits certain safety appliances would bring, and as to how long those credits would exist. That is the reason I made the guarded reference to it that I did. I think, if a man is going to spend $600 or $700 in putting in safety appliances, and probably this year it will not bring a return to him of over $300 or $400 in his insurance premium, there is certainly, except from the standpoint of the prevention of accidents, little justification from a financial standpoint, unless he knew that that safety appliance would meet the requirements for a period of two or three years.

Question:—I take it that the motive is not only to reduce our rates, but to take care of our employees as far as possible. This agent made the statement that the Commission would not approve or disapprove any improvements we made. Is that correct?

Mr. Slate:—No sir; the Commission has the right to approve any set of safety rules you put in. When I say safety rules, the attorney-general has ruled that we have no right to approve discipline rules. If you put up a ruling, a safety rule, that he must not use a machine unless it is in good order, we have the right to approve that, but if you put at the bottom of that, that any infraction of this rule will cause the immediate discharge of the employee, we would have to strike that out. We could not approve any discipline rule, and that would have to be left out if you

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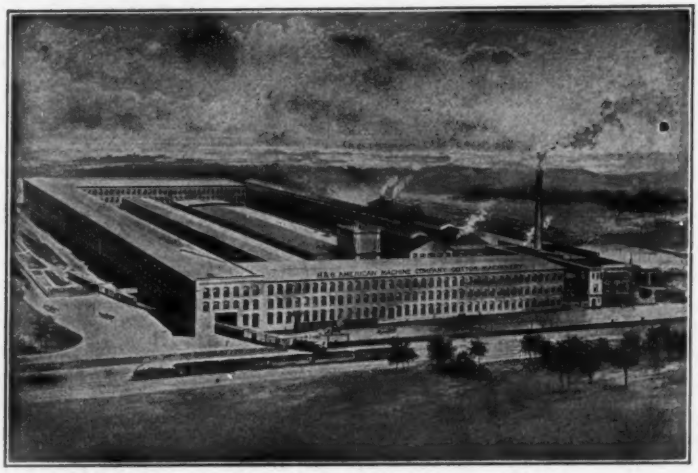

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wanted that rule approved by the Industrial Commission of Georgia.

Question:—Can anybody tell us positively that a safety device we put in would serve to give us a credit? I have not found anybody yet that could tell us that.

Mr. Slate:—Yes sir; they will figure with you on that. The Commission won't; but the insurance company will. I have seen supposed diagrams of certain plants in this state showing the exact credits that certain safety devices would produce, and how they should be placed around different machines. I have seen that especially in cotton mills. Now what I want to know is how long it will produce those credits. I have not been able to get at that satisfactorily.

Question:—We want uniform protection that is good in any company. Suppose the United States Fidelity man comes along and makes a recommendation that, if a certain improvement is made, that company might reduce the rate. Suppose we make that improvement, and suppose we become dissatisfied with his company and we went with some other company; then would we have to have a re-inspection?

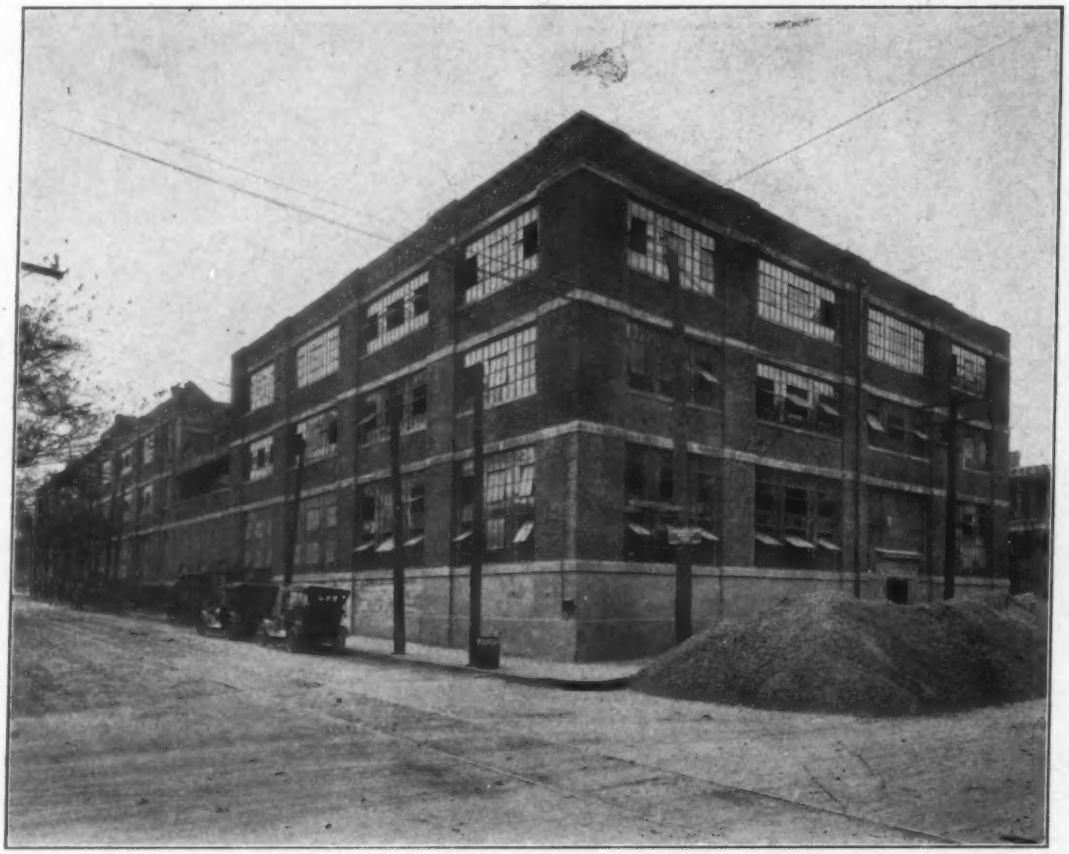
Mr. Slate:—That is what we are trying to bring about. That is what we are trying to get. We can only bring that about by an agreement of the insurance companies. We have no authority to appoint an inspector.

J. C. Gentry (Atlanta):—Mr. Slate, I would like to clear up some misunderstandings as to the method and manner of making reports. As we understand it, we or our managers send in this original report of an accident. That comes in duplicate. We send the original to the insurance company carrying our risk. They make up the report of the case to your office. Then comes this second report, showing when the injured man returns to duty. A copy of that is sent to the insurance people and they make a report to your office. Now the question arises after that, to what extent should our company go in taking up the question of compensation, if it should be taken up with this injured employee, or does the insurance companies take this matter up and bring it to a final conclusion?

Mr. Slate:—The insurance companies take it up.

J. C. Gentry (Atlanta):—That question has been asked, and I wanted to have that clear. Now, as to the second proposition: We have taken exception to the rate charged. According to my understanding of this act, Mr. Slate is our representative, and the other two gentlemen on this commission are authorized by the act to make the rates, but however in some manner it become referred to the Insurance Commissioner. We talked with the Insurance Commissioner, and it appears that he is not very favorably inclined towards the act. He thinks that, to a certain extent, it takes away from a privately-owned company certain inherent rights belonging to it, and he is opposed to any legislation that will take away any of those rights, but when the question of rates being referred to him was taken up, he said, "I have not anything to do with that, and you will have to go to see the rating bureau that has been appointed to make these rates." Calling on the rating bureau, they say "We will give you a hearing," and arranged certain dates, which were afterwards cancelled, and so on. So I was very much delighted to hear you say that you had taken up these complaints and I wanted to clear that up for others that probably may be in the same condition.

(*Continued on page* 656.)



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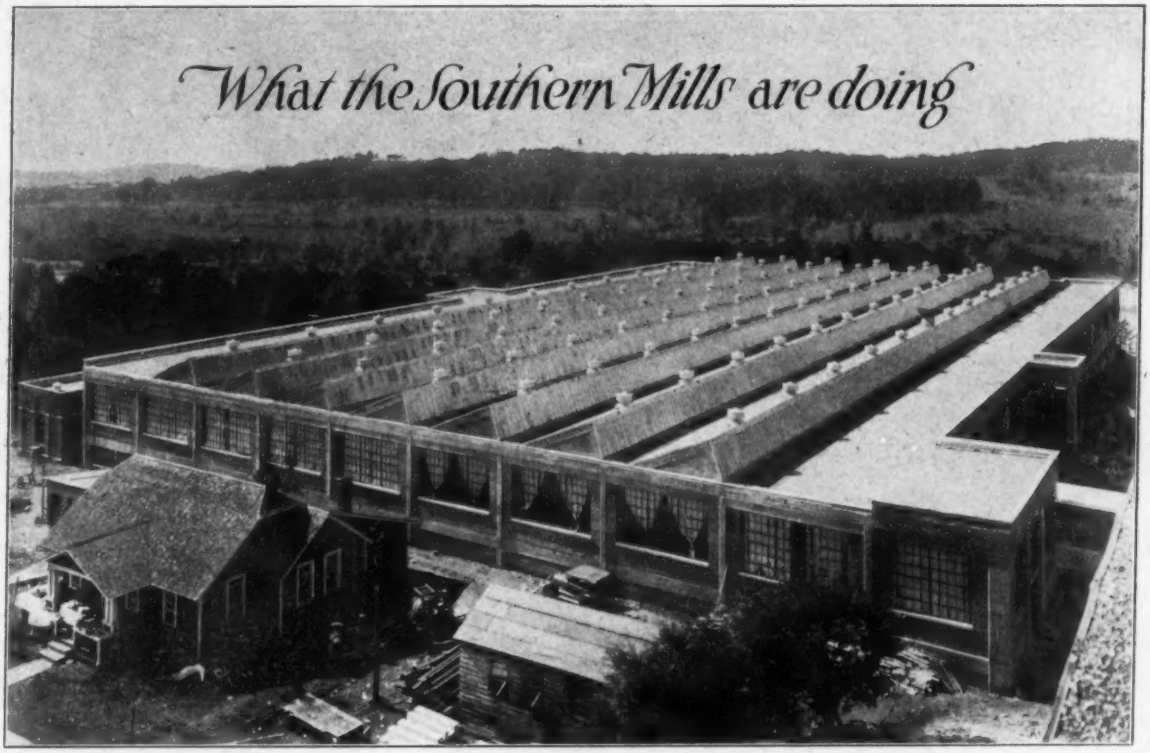
What the Southern Mills are doing



EXTERIOR OF THE RECENTLY COMPLETED WEAVING SHED AT THE PLANT OF THE COLUMBUS MFG. CO., COLUMBUS, GA.

The regular monthly meeting of the overseers, second hands and section men of the Whitney (S. C.) Manufacturing Company was held on Tuesday evening, April 19, with about forty-five men and women present. A delightful supper was enjoyed, following which the regular discussion period was opened by the superintendent, B. R. Burnham, and several valuable suggestions were offered by several of those present pertaining to better production in the mill and to village affairs. The feature of the evening was an address by Maj. William T. Morgan. This talk was of an inspirational nature.

The April meeting of the Carolina Cooperative Council of the Carolina Cotton & Woolen Mills Co., Spray, N. C., was held in the central Y. M. C. A. building on Wednesday evening, April 13th. The principal speaker of the occasion was Dr. Lincoln McConnell, widely known orator and lecturer. The members of the council had been asked to invite their wives and sweethearts to this meeting, so that all might enjoy the privilege of hearing this splendid speaker, and the large auditorium was well-filled. Doctor McConnell spoke on the subject, "The Guy that Delivers the Goods."

Another item of interest reported from Spray was the graduation exercises of the night classes in vocational education work at that place recently. Over 75 students participated in these exercises. It is stated that more than 25 different vocational classes were organized and taught in this community during the season of 1920-21.

The Republic Cotton Mills, Great Falls, S. C., have recently completed a large cotton warehouse having a capacity of 2,000 bales. This mill is also completing ten attractive bungalows for its office and clerical force and has finished about fifteen other dwellings for other employees, all of which are equipped with all conveniences.

The Abbeville (S. C.) Cotton Mills are developing an attractive recreation park, the plans of which include spiral walks, tennis courts, rose arbors, bandstand, rustic bridge, summer house, etc.

Operations have been instituted at the Rowan Cotton Mills, Salisbury, N. C., on yarn for fine grade underwear.

The E. M. Holt Plaid Mills, Inc., Burlington, N. C., contemplate the installation of a sprinkler system. Walter M. Williamson is secretary and treasurer.

The name of the Yadkin Finishing Company, Lexington, N. C., has been changed to the North Carolina Finishing Company.

The Judson Mills, Greenville, S. C., have had plans prepared and awarded contract for a dye house. Exterior walls will be of brick with daylight sash. The structure will be covered with a monitor roof supported by steel beams, and will be 40 by 90 feet.

The Mooresville (N. C.) Cotton Mills are erecting a dye house and bleachery, which when completed will double their dyeing capacity. The new boilers now are being installed and new houses for operatives are being constructed.

A charter with a capital stock of $150,000 has been granted to the Stuart Textile Corporation, Danville, Va. The concern has purchased a tract of land containing 65 acres and a yarn mill is to be erected thereon.

It is understood that a 70 x 75 foot addition will be built to the mill of the Magnolia Textile Corporation, at Magnolia, Miss., to be used as a cloth room.

It is reported that the Cohannet Mills, Fingerville, S. C., contemplate increasing their capital stock to $200,000.

Alexander City (Ala.) Cotton Mills are planning for the installation of a number of new looms and auxiliary equip-

ment; the plant is now operating with a total of about 13,000 spindles and 300 looms.

It has been announced by W. A. Johnson, general manager, that the southern headquarters of the Consolidated Textile Corporation will be moved from Greensboro, N. C., to Lynchburg, Va., the corporation owning a large cotton mill in the latter city.

The Mecklenburg Mills, Charlotte, N. C., are reported as arranging for an increase in capital from $400,000 to $600,000.

Production is expected to start October 1 in the new plant of the Kingsville (Tex.) Cotton Mills, which will have 5,000 spindles for the manufacture of 8s to 12s yarns.

The Wateree Mills, Camden, S. C., have recently installed 420 new Draper looms, replacing 492 older looms.

The North State Cotton Mills, Taylorsville, N. C., have begun the construction of a new hydro-electric power plant, with an initial equipment of about 200 hp. capacity.

Falls Manufacturing Co., Granite Falls, S. C., has awarded contract for construction of a new hydro-electric power plant of 400 hp. capacity.

The Royal Mills, Charleston, S. C., have engaged the services of Lockwood, Greene & Co., engineers, to assist in re-organizing the mill personnel and to make a complete report outlining the procedure for re-organization and development of the mill.

The New England Mill Situation.

The effects of the drastic price liquidation in cotton mills are now being reflected in the New England mills. Dividends reported for the second fiscal quarter of the Fall River mill year averaged only 1.99 per cent on a capitalization of $38,510,000, comparing with an average of 14 per cent for the whole year of 1920. Five corporations passed their regular dividends.

In the interval, the Parker and Hargraves mills fell into financial difficulties as a consequence of the shock to values last year and were placed in the hands of committees representing stockholders and creditors. The Laurel Lake mills have also been placed in the hands of a committee of local mill men to the end that some of the bank liabilities may be extended. The treasurers of these mills resigned. All the corporations are over 30 years old and are in good physical condition.

Curtailment of production at this center continues to the extent of 25 per cent of the capacity. Some mills have adopted the plan of running four days a week, others shut down a week or two at a time, while a few have been shut down for an indefinite period.

In Fall River and New Bedford, the manufacturers have agreed with the unions not to make a change in the wage schedule in the six months' wage period beginning June 1. The view was expressed that nothing was to be gained in the way of additional business by any wage cut that would be within reason, the contention being that the gain would all go to the trade in the hard competition likely to be seen for the limited business offering. It was also said that rents, coal, and other costs of living had not been reduced in keeping with recent wage reductions, and it was thought better to make a stand for a better average wage in cotton mills than that which prevailed before the war.

A very large part of the product of Fall River and New Bedford mills goes to the converting trade and that division of the market has been hard hit in the past year. Until money conditions are easier, finishing costs lower, and general retail business is on a lower relative price plane, the converters hesitate to order goods in advance of their actual needs for a short time ahead. It is also true that some manufacturers are loath to sell ahead until credit conditions are clearer throughout the whole trade.

The fine cotton goods trade has suffered more from a contraction in business than the print cloth numbers. The spring trade has been one of steady liquidation in many of the combed yarn fabrics. Retailers have done their best business on the staple standard domestic fabrics and the cool weather has slowed up the demand for the fine wash goods. Moreover, this division of trade has suffered to some extent from the competition arising from the large cotton goods imports of last year, particularly the fine yarn goods from England.

One of the curious features of trade conditions in the New England field is the activity of the large print works. The Pacific, American, Algonquin, Windsor and Arnold works, are all running to full capacity and some departments have been running at night to keep up with the demand for percales, standard prints, cretonnes, low end draperies, plisses, and other special printed fabrics. The printing departments of the large finishing companies have been quieter than either the dyed or bleached goods divisions. The latter have been showing steady gains.

The condition of finishing plants at the first of the month, as to orders in hand, and stock ahead, was better than at any time for the past six or eight months, but there is yet much to be accomplished before finishing companies as a whole are on a profitable basis. Much of the work done proves unprofitable because of the relatively small parts of the plants in operation, thus causing heavy overhead costs.

It is some years since labor conditions throughout the whole field were so tranquil. This is due of course to the fact that work is not over plentiful in many centers. Idleness has brought about a change in the temper of those who were swayed during war time by revolutionary agitators, and it is also true that manufacturers have not been arbitrary in pressing the advantage idleness creates among the working population. Mill work is not as popular as it used to be even at the higher wages and there are instances easily cited of mills having plenty of orders that are unable to secure all the desirable help they can employ.

While curtailment of production continues large in some centers, taking the field as a whole there is less idle machinery than there was a month ago. This is explained by the slow revival of trade in the tire fabric and yarn mills that were completely idle for months. There has also been a slow revival of the trade in combed and carded yarns. The orders recently taken have not been profitable but they have served to get the mills started again. Mills making the finer qualities of yarns for the men's wear trades, curtains, fine knit goods, and fine combed yarns for the dress goods trades, have been getting business slowly in the past month.

There are some divisions of the New England mills in a very strong position. This is notably true of the mills making ginghams, wide sheetings, cotton blankets, colored napped goods, pillow tubings, and fine shirtings. Mills making very fine dress goods specialties such as zephyrs, tis-

sues, and the choice qualities of silks and cottons are again becoming busy on long term contracts for goods to be delivered for the spring trade of 1922. This specialty business supplies orders principally for a few large plants and they are conspicuously successful in meeting the needs of the large converters handling the highest priced cotton products.

The Amoskeag Company has been able to sell everything it can produce in the way of tickings, staple and dress ginghams, chambrays, bleached cottons, and specialties in napped goods. The Pepperrel has done a large business on its wide sheetings and export drills, sales of the latter for India having run into substantial figures in the past month or two. The Nashua cotton blanket mill, the largest in the country, resumed full operations this month for the first time since last fall. These are isolated cases of special activity in large plants making well known standard goods widely known throughout the country.

One of the features of business in the trade has been the very well sustained demand for goods sold under the older trademarks and especially those that have been widely advertised for years in retail stores. Fruit of the Loom under new management is now being made to include fine wide sheetings, bleached muslins and all kinds of other narrow bleached fabrics, fine white and printed shirtings, handkerchiefs, etc., and the sales of the common 4-4 Fruits have been twice as large as in normal years. Naumkeag products, such as Pequot sheetings, sheets and pillow cases, have had an extraordinary sale and this large new mill and its adjunct the Danvers Bleachery, has been run in full with orders far ahead.

The value of trade-marked merchandise appears to have taken on new interest as seen in the determination of the Wamsutta mills to make its own sheets and pillow cases and sell its own bleached and brown wide sheetings to the trade, through agencies that hitherto handled only a part of the output. Some of the other wide sheeting mills have plans underway for making up their own wide goods into finished articles ready for the home. Massachusetts mills recently began advertising a line of cotton blankets under the trade name, "Downnap," while the sales of Beacon blankets made in a New Bedford mill have been increasing rapidly. This trade is to some extent an outgrowth of confidence in what is represented by the mark coupled with the low contrasting prices now current.

It is only within a month or two that there have been signs of a positive revival of trade in many of the miscellaneous cotton goods plants that use sale yarns, such mills for example, as braid, tape, webbing, and wire insulation plants. The slow revival of the automobile business has led to a very general resumption of demand for goods that were made and not accepted, or deferred in delivery. But many other trades outside of those catering for dry goods store business are still quiet and mills supplying them do not get running very fast. Shade cloths, some of the finer lining fabrics, used in the garment and clothing trades, specialties used in the bag trades, raincoatings, umbrella cloths, and so on, suggest where idleness has been continued longer than in some other directions.

Although several of the cotton mill machinery concerns were able to deliver some part of the large contracts they had in hand a year ago, others found themselves in a position where deliveries could not be made profitably. Hence there is more irregularity of employment in machinery circles than there was a month ago. There are some concerns that are running as full as they can while others have slowed up.

It is generally believed among New England cotton goods men that the trade is in for a slow summer. The work in hand will not show much profit and in many instances it was accepted as the best means of preventing further large losses through idleness. The sustained price on cotton has attracted much comment from the fact that values have held although exports have been small. Most New England mill men have not been bears on cotton for the reason that many had stocks, and others have contended for some time that a better average price for the staple will result in a better average staple, which is the great thing desired among New England mills as well as many elsewhere. Generally speaking, the conviction prevails in the field that the industry has passed through its worst after-war shock.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, May 16th, 1921.

The ray of hope entertained one month ago as result of the more favorable developments in outside conditions has been partly realized in the reactionary tendency of the market.

The final settlement of the German reparations question, as yet has had no appreciable effect on values except on foreign exchange, which is ruling higher than for a year. It is generally recognized that Germany's submitting to war indemnity terms imposed by the Allies is the most momentous event since the signing of the armistice in November, 1919. It is generally believed that the adjusting of the reparation matter is the one step necessary to permit the world to gradually return to normalcy.

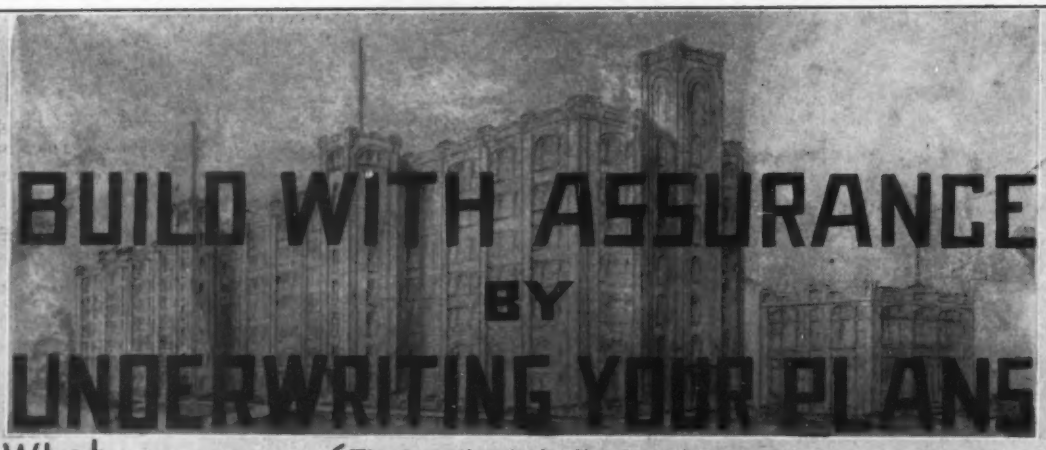
At any rate, payment to the United States of the large war loans made to the Allied nations is assured, and that the next move will be a refunding of the large indebtedness of France, England, Italy and Belgium, permitting those countries to pay the interest annually and the principal eventually, at the expense of Germany.

Meanwhile there is a large and constant influx of gold to America, thereby upbuilding the surplus of the Federal Reserve System, which is reflected in a lowering of the discount rate from 7 to 6½ per cent, in some instances to 6 per cent, with every indication of a gradual decline to the pre-war level of 4 per cent eventually.

The only fly in the ointment remaining, so far as cotton is concerned, is the continuance of the British coal miners' strike, in effect since December 15th last, but hope is entertained of a settlement of this important trouble in the near future.

In the meantime Manchester reports an accumulation of orders for cotton goods, awaiting the settlement of the coal strike, due to a better demand from India and China.

There is no lack of evidence of trade and financial conditions improving in the United States, as noted by cheaper money and increasing consumption of raw cotton by American mills. In December last American mills consumed only 295,000 bales of lint cotton, in January 366,000, in February 396,000, in March 438,000, and were it not for the Easter holidays and April being a short month re-



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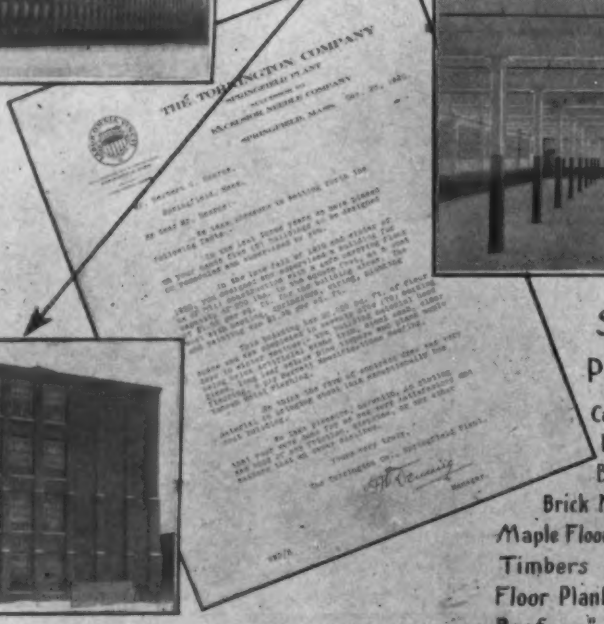

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Brick Masons $7.50 to $8.00 " " "
Brick Mason Helpers $5.00 to $5.50 " " "
Maple Flooring $66.00 per 1000 feet B.M.
Timbers $100.00 " " " " "
Floor Planking $75.00 " " " " "
Roof " $60.00 " " " " "
Common Brick $20.00 per 1000
Roofing 15¢ per square foot
Steel sash and Glazing 60¢ per sq. foot

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turns for last month would probably have been larger than the reported 408,000.

After the British coal strike is settled, British spinners are apt to modify the present half-time schedule, perhaps lift it altogether, and the same improvement in consumption noted in the United States, is likely to be witnessed in England.

At the close of April, mills in the United States held a stock of raw cotton of only 1,316,000 bales vs. 1,811,000 last year, and stocks held by European mills are undoubtedly small also, as the visible supply of American abroad is light; on May 6th only 1,435,000 bales against 1,994,000.

Of course, as is generally known, the South has a large amount of cotton still to market, about 3,664,000 more than at this time one year ago, or about 6,933,000 vs. 3,269,000. but it is firmly held.

To offset the existing apparent big surplus, southern farmers, returns from the interior indicate, have adopted the policy so widely and strongly advocated the past several months of making a drastic reduction in the cotton acreage this year of about 30 per cent, pointing to a crop of about 4,000,000 bales less than was made last year, which is expected to overcome the indicated large carryover by the world of about 10,000,000 bales at the end of next July vs. 6,086,000 last year.

Consumption by the world of American cotton this season points to only about 10,000,000 bales vs. 12,735,000 last season and a previous record of 15,000,000 bales in the season of 1915-16. Therefore, with an indicated supply of about the same as this season's for next season, there is every reason to anticipate better prices as consumption by the world increases in the future.

Cloth Testing

BY JAMES ROBERTSON.

Much care, much thought and much work is expended in preserving the strength of the yarn in the spinning and in bringing it up to and above the standards set for the breaking strength of that number. And a thing which should really be sought, also, is preserving this same strength in the fabric when it is finished, for that is the ultimate product which goes to the market and upon which the reputation of the mill is built. We hear of this or that standard cloth possessing certain characteristics, and from these the reputation of this product is branded in the mind of the converters and consumers, all depending upon the *finished fabric* and not the finished yarn.

No matter if we produce the very best yarn imaginable there are yet many ways to later destroy all the strength, elasticity, and uniformity of this yarn by neglecting the processes after spinning. The writer once followed tests between two different mills in widely different sections of the South and the results obtained were very interesting in the following way:

We will say for the matter of illustration that Mill No. 1 was in North Carolina and Mill No. 2 was in Alabama. These two mills were both making the same standard construction of a sheeting under contract and this fabric had to average a certain break in the finished fabric to fulfill the terms of this contract.

Daily samples were sent from these two mills to the place of testing where ideal humidity conditions were maintained at 60 per cent relative humidity. Also there was sent in daily, samples of the yarn used at each mill. Now Mill No. 1 made a finished fabric which broke up to standard in the cloth and weighed closely to the requirements, but the breaking strength of the yarn was somewhat below the Draper Standard.

Mill No. 2 made a fabric that did not come up to the standard as set by Mill No. 1, yet, on the other hand, the yarn broke far superior in both warp and filling to the yarn used by Mill No. 1. And this seems strange indeed, for we should expect that with better and stronger yarn, a better and stronger fabric could be made. However, it did not prove out in practice.

This is the point that I am endeavoring to bring out in this article—to run tests daily on the finished fabric to ascertain whether or not the strength of the yarn is being preserved through the spooling, warping, slashing and weaving. Also we know that brushing may be used to disadvantage if too much stretch is made on the cloth.

The only additional apparatus needed for this work is the clamps which the makers of yarn testing machines manufacture, and these can be used with their standard testing machines.

To give a concrete example of what may be done along this line the following experiment is given in full which shows the breaking strength of the warp in the cloth across its width beginning at one side and testing every two inches but cutting strips two inches wide and four inches long, lengthwise with the warp.

THE TEST.

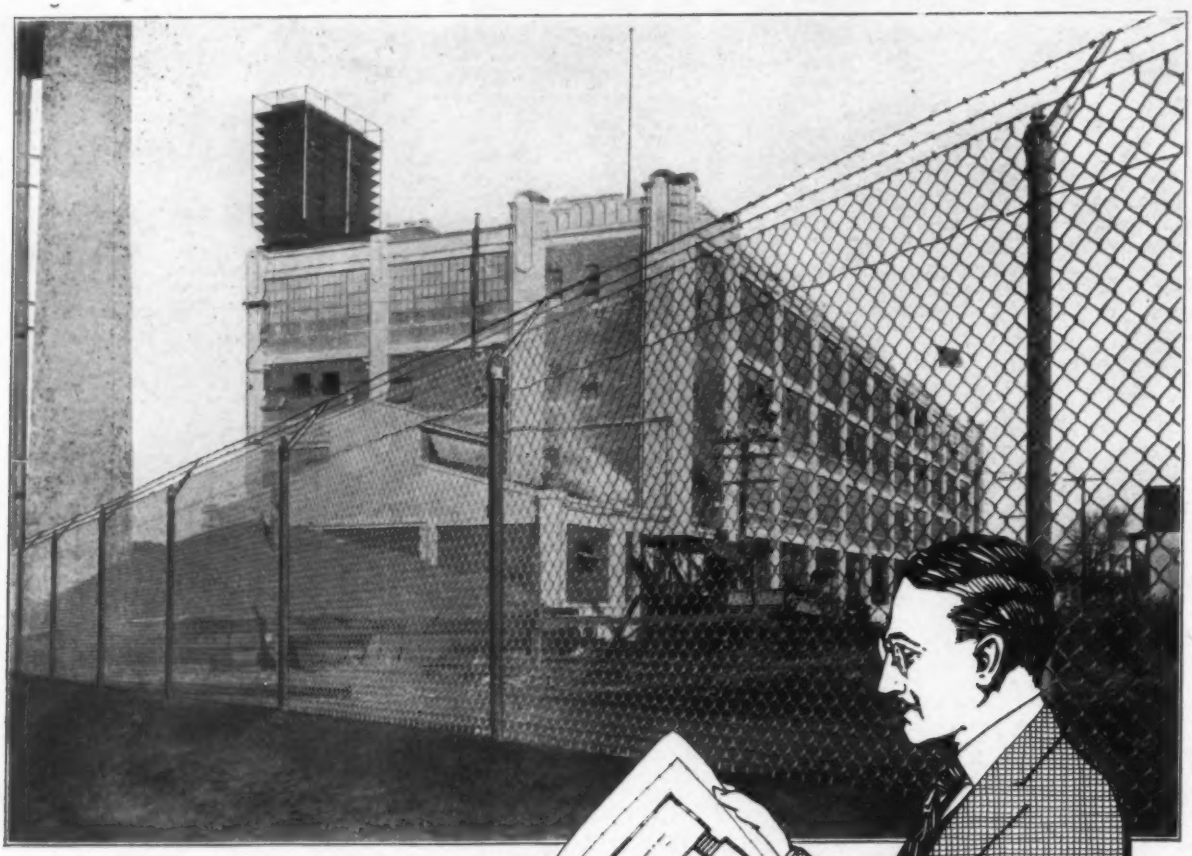
OBJECT:—To determine the relative strength of warp breakage across the width of the test fabric.

FABRIC:—Plain sheeting 80 x 88, 40 inches wide.

METHOD:—Starting at the left-hand side, 19 strips were cut measuring 4" x 2", the lengthwise being parallel with the warp threads. "Grab" test method used with 1 inch jaws and 1 inch apart. The jaws were placed in the center of the 2 inch width, allowing ½ inch on each side to the edge. Rate of stress, 15 inches per minute.

RESULTS:—

Strip No.	Inches from Edge	Count	Pounds Breaking Strength
1	2"	80	46.0
2	4"	79	46.0
3	6"	79	43.0
4	8"	79	50.5
5	10"	79	40.5
6	12"	78	46.0
7	14"	79	43.5
8	16"	79	47.0
9	18"	79	47.0
10	20"	79	48.5
11	22"	79	46.5
12	24"	78	55.0
13	26"	79	43.5
14	28"	78	52.0
15	30"	78	51.5
16	32"	79	50.0
17	34"	80	52.0
18	36"	80	50.0
19	38"	80	50.0



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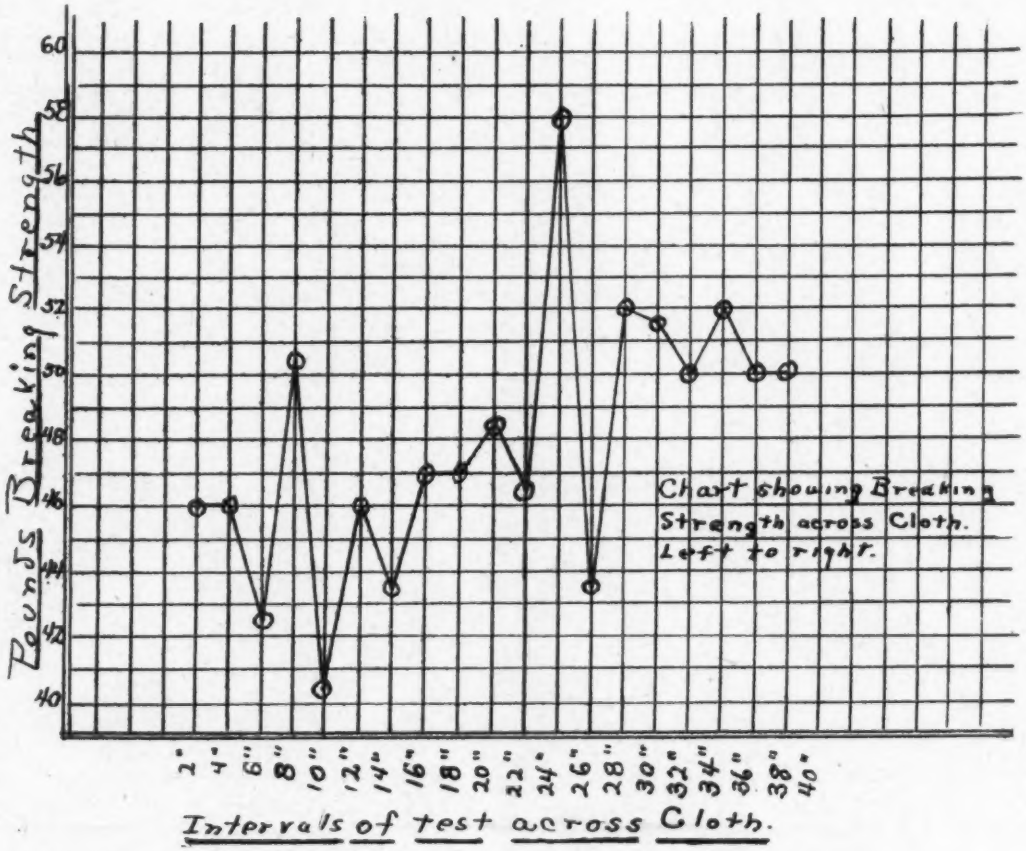

From this chart and from these test figures we can readily see that the right-hand side of the cloth is decidedly stronger than the left-hand side of the fabric. We naturally seek to reason what might cause this particular side to be the weaker.

The fact that the irregularity exists only on one side of the cloth eliminates the spooling as the entire width would most likely be weaker as a whole. The idea of one weak beam from the warper would cause the warp also to break weaker across its entire width, but still there is the possibility that should the warper beams all be from the same warper the creel on one side of that warper may be out of the vertical and thus causing more friction on the spools with a loss in elasticity and strength in the warp yarn.

Also the presser roll on the slasher, where the yarn is put on the loom beam, has two adjusting screws. Now putting more pressure on one side packs the yarn on that side to a smaller diameter which would therefore cause it to weave under more tension and strain—causing ends to break on this side of the warp in the loom, for upon each revolution of the loom beam, more yarn would be left off on the larger diameter than on the smaller.

Things like this can be found by systematic study and tests. All mills keep a record of the breaking strength of the yarn from day to day and it seems to me that the same information could be of considerable value in the matter of the breaking strength of the finished cloth. Then reliable information could be had as to whether the slashing, warping and spooling were doing their work without injury to the yarn, for we know if the breaking strength of the yarn materially increases with a lot of cotton, then the breaking strength of the cloth should also be increased in proportion. If this is not the case there is something wrong between the spinning and weaving which is straining the yarn beyond its elastic limit.

For those desiring it, a form is given in detail which has been used to advantage by the writer.

CLOTH TEST—MILL.

Fabric ---------- Construc'n--x--W--'s, F--'s
Date of Sample ---------- Date of Test ----------
Humidity — DB--WB---D--- Relative Humidity----%
Weight---------Oz. per yd. Regain----%
Yards per lb.
Count—Warp 1--2--3--4--5-- Filling 1--2--3--4--5--
Average ---------- Average ----------
Width Standard-----inches. Width Actual-----inches.
Type Selvage----------

BREAKING STRENGTH—METHOD.

Warp		Filling	
Test No.		Test No.	
1	lbs.	1	lbs.
2.	lbs.	2	lbs.
3	lbs	3	lbs.
4	lbs.	4	lbs.
5	lbs.	5	lbs.
Average	lbs.	Average	lbs.
Standard	lbs.	Standard	lbs.
Above Standard	%	Above Standard	%
Below Standard	%	Below Standard	%

Remarks: Tested by ----------

Notes About Men You Know.

ROBERT A. MORGAN has been promoted from assistant agent to agent at the Maginnis Cotton Mills, New Orleans, Louisiana.

S. L. MCCRACKEN has resigned as assistant superintendent at the Ware Shoals (S. C.) Manufacturing Co., and accepted a position with Grendel Mill No. 1, Greenwood, S. C.

I. K. EDWARDS has been appointed superintendent of the Anchor Duck Mills No. 2 plant at Rome, Ga.

C. L. UPCHURCH, formerly of Atlanta, Ga., is now superintendent of the Lauderdale Cotton Mills, Meridian, Miss.

C. L. PERKINS, president of the Perkins Hosiery Mills, Columbus, Ga., died recently after an extended illness.

JOHN M. RHODES, cotton manufacturer and prominent citizen of Lincolnton, N. C., died recently at his home in his 72nd year.

RICHARD L. WEST has been appointed superintendent of the Clyde Mill Co., Newton, N. C.

B. L. LEDWELL, superintendent of the Yount Cotton Mills, Conover, N. C., has also been appointed general manager of the Blue Ridge Cotton Mills, Connelly Spring, N. C.

J. S. MOOTY has resigned as overseer of weaving at the Piedmont Cotton Mills, Egan, Ga.

J. G. SCHAEFFER has been appointed North Carolina state representative for the J. B. Ford Company, Wyandotte, Mich., manufacturers of the "Wyandotte" line of chemicals. Mr. Schaeffer will maintain headquarters in Charlotte, N. C.

T. N. WEBB, of Hillsboro, N. C., has been elected president of the Raleigh (N. C.) Cotton Mills, and J. F. Marsden, Jr., has been made treasurer.

JAMES MILLAR has been appointed southern branch manager of the Scandinavia Belting Company, with headquarters at 40 East Hunter Street, Atlanta, Ga. Mr. Millar succeeds the late Jefferson W. Carter in this position.

ROBERT KENNETT, who has been connected with the White Oak Mills, Greensboro, N. C., for ten years, has resigned and accepted a position with the Altamahaw Cotton Mills, Elon College, N. C., as overseer of dyeing.

J. E. ARTERS, formerly of C. M. Plowman & Company, Philadelphia, is now connected with the yarn department of the J. Spencer Turner Company, and will have charge of the knitting yarn section of this department. Mr. Arters has been in the yarn business for some time and has an extensive acquaintance among the yarn mills and knitters.

E. N. MCGUINN has accepted the position of superintendent at the Landrum (S. C.) Cotton Mills.

L. L. LEWIS, who has been connected with the Atlanta office of the International Time Recorder Company, removed to Charlotte, N. C., early in May where he will have charge of the recently opened office of this company at that place.

WARREN H. PEARMAN has been promoted from second hand in spinning to overseer of spinning, spooling and warping at the Hartwell (Ga.) Mills.

W. B. BRIDGES has resigned as overseer of carding and spinning at the Calvine Mill, Charlotte, N. C. He is succeeded in that position by J. M. Creekmore, formerly overseer of carding and spinning at Anchor Duck Mills No. 2, Rome, Ga.

WILLIAM MILLER has been made overseer of carding at Necronsett Mills, Cumberland, N. C.

JAMES ESCOTT has been appointed superintendent of Couch Cotton Mills, East Point, Ga., succeeding J. H. Bagwell, resigned.

C. H. STORY, formerly connected with the Poinsett Mills, Greenville, S. C., has been made overseer of cloth room at the Judson Mills, of the same city.

FRANK A. KERR, overseer of spinning at the Centreville (R. I.) plant of B. B. & R. Knight, Inc., was elected president, and Clifford Eccleston, overseer of carding at the Arctic (R. I.) Mill of the same corporation, was chosen secretary of a permanent baseball association organized recently by the Knight employees in this corporation's mills in the Pawtuxet Valley, including the mill villages of Lippitt, Jackson, Riverpoint, Arctic, Centreville, Pontiac and Natick.

LESLIE H. ALLEN, who has recently been with Fred T. Ley & Co., contractors of Springfield, Mass., first as an industrial housing engineer and then as sales manager for New England territory, has joined the staff of the Portland Cement Association, 111 West Washington St., Chicago, as assistant manager of the cement products bureau. Prior to joining the Ley organization, Mr. Allen was for 12 years with the Aberthaw Construction Co., of Boston.

HARTLEY HOWE, manager of the Detroit office of Lockwood, Greene & Co., engineers, has been transferred to Boston, where he becomes district manager of the Boston office, succeeding Kenneth Moller who was recently elected into the firm of Lockwood, Greene & Co.

ELVIN H. KILLHEFFER, vice-president of the Newport Chemical Works, Inc., arrived in Vancouver, May 16, on the S. S. Empress of Russia, after an extended trip in the Orient in the interests of his company. Through his endeavors the company has established permanent offices at No. 6A Kiangse Road, Shanghai, China, from which point the Chinese trade will be handled.

JOSEPH LALLA is now overseer of the cloth and finishing room at the Maginnis Cotton Mills, New Orleans, La.

C. N. HARPER has been appointed overseer of weaving at the Edna Mills, Reidsville, N. C.

J. M. LUMLEY has resigned as overseer of carding at the Atherton Mills, Charlotte, N. C., to accept a similar position at the Fidelity Manufacturing Co., Charlotte, N. C.

T. H. ROBERTS, formerly connected with the Adrian Mills, Mt. Holly, N. C., has accepted the position of carding overseer at the Atherton Mills, Charlotte, N. C., succeeding Mr. Lumley, resigned.

L. R. OGLETREE, from Roanoke Rapids, N. C., has been appointed night overseer of weaving at the Fidelity Manufacturing Co., Charlotte, N. C.

G. GUNBY JORDAN has been elected president of the Perkins Hosiery Mills, Columbus, Ga., to succeed the late C. L. Perkins. C. J. Tune was named to a membership on the board of directors.

J. D. JOHNSTON has resigned as overseer of spinning at the Demopolis Cotton Mills, Shortleaf, Ala., and is now foreman of fly frames at the Knoxville (Tenn.) Spinning Company.

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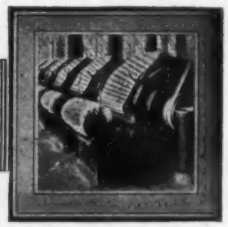
STRAIGHT LINE METHODS

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Results from Frequent Card Stripping.

EDITOR COTTON:

I notice in the March number of COTTON the article in regard to the frequency of card stripping, which I read with interest. I want to relate a little experience we had recently at our mill in this connection.

We use the automatic vacuum stripping device in our plant and our custom was to have the cards stripped twice a day. However, we noticed that this was not sufficient to keep the card stripper busy, and, as an experiment, started him to stripping the cards four times a day instead of twice a day. After we did this we found that the breaking strength of the yarn increased eight pounds over what it had been when the cards were being stripped twice a day, and this brought the breaking strength up very close to standard. Also, we found that with this system of stripping, the cotton was cleaned much better, and more of the fly and trash was taken out. It is known that if the cotton on a card that has just been stripped is examined, it will show up much cleaner than that on a card which has not been stripped. Furthermore, the help reported that the work ran much better under the new stripping schedule.

We were running low grade cotton, and were of necessity working the cards very hard and pushing them to get production. If a mill is running good, clean cotton, with little trash and foreign matter, and is running it light, it might be that the arrangement might not apply to that case as they would not have as much foreign matter in the cotton. However, it works satisfactorily in our case, and we get a higher breaking strength and cleaner work as stated, but I should like to have some of the correspondents to your Practical Discussion Department comment upon the following question: If our breaking strength increased and the work ran cleaner and better after we doubled the number of strippings per day, just what would be the limit, or what is the greatest number of times we can strip a card per day and get better work? B. C. (Miss.)

Further Suggestions on Picker Eveners.

EDITOR COTTON:

I read with interest the letter from "W. H. H. (Ga.)" in the March number of COTTON in which he called attention to the possibility of uneven draft with the evener equipment now used on pickers, and have waited to see what answers his inquiry would bring.

The letter from "Tom (Mass.)" in April COTTON, coincides with my own opinion as to the feasibility of driving the feed rolls at a constant speed. If this were done and an attendant failed to put on a new lap when an old one ran out, the feed rolls would not get enough cotton, as it is almost certain that the thin lap fed in by the evener rolls would simply pucker up between the evener and feed rolls until it might form a serious choke.

A possible solution might be to abolish the evener rolls and put the evener treadles directly over the feed roll, but this could not be done conveniently on old machines.

I think it would be interesting to hear from some picker manufacturers on this point, as no doubt they have gone into it thoroughly and have found that the present arrangement should work satisfactorily unless, as "Tom" suggests, there is some other cause for thick and thin places.

It seems quite probable that a common cause of thick and thin spots is belt slippage on evener cones. Theoretically, an evener once properly set should deliver the correct amount of cotton without further change. Yet a man in the South has made quite a bit of money out of a contrivance by means of which an evener can be set from the front of the picker by turning a handle, which would seem to show that frequent evener settings must be necessary.

The only thing that I can think of that would make such frequent settings necessary is belt slippage. I have seen evener cones wrapped with cord, and covered with leather, to keep down slippage, and I have seen places where the old evener belts have been removed and wider belts put on.

The cause of this slippage must be due to the drag of the apron loaded with heavy laps, as the feed rolls should not offer any great resistance to the evener mechanism. This drag is no doubt considerable, as I know of places where it has caused so much apron breakage that sprockets and chains have been used to give a positive drive on the back roller.

A drag that would cause this trouble with aprons must be enough to throw too much load on the evener, and there will be a tendency to belt slippage, which will be worse when the belt is on the small end of the cone than when it is in normal position or on the large end. When the evener attempts to speed up and the belt goes down on the small end of the cone the slippage will probably cause a noticeable thin place in the lap.

The total of the thin places will cause laps to run out light and when the evener is set for heavier lap to correct

this, while the whole lap may weigh out right, it will have a lot of thick and thin places to make up the average.

I believe that this trouble can be largely overcome by the use of anti-friction bearings on apron rollers, so that the evener will have practically no load except that required to push the cotton through the rolls, which should be very little.

Small ball bearings placed on apron rollers would certainly minimize the pull on the apron, which should do away with any necessity for positive rear roller drives, and should prolong the life of the apron and get better results with the evener. A. P. A. (S. C.)

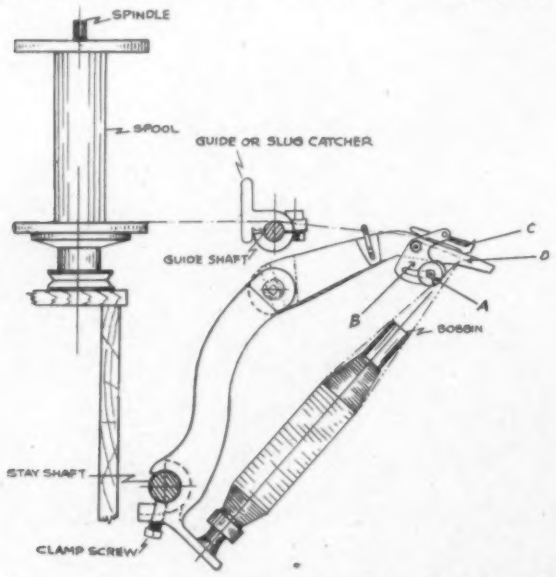
A New Spooler Tension Device.

EDITOR COTTON:

A new tension device for cotton yarn has recently appeared on the market in New Bedford, Mass., and has been used in the cotton mills for the past six months where it has proved to be remarkably successful. The demand for this device has exceeded the present supply to such an extent that steps are already being taken to enlarge the output by adding to the manufacturing plant and equipment where this device is made.

This invention is patented and is the product of three practical mill operatives who have been perfecting their device, step by step, until the present result seems to meet all the demands placed upon it.

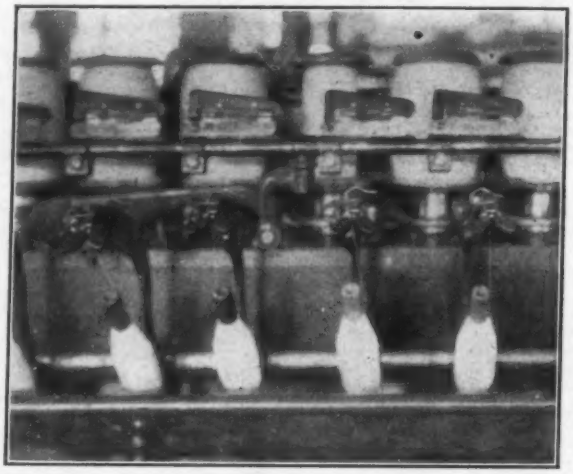
The drawing shows a flat piece of spring steel bent into the shape of a hair pin with two crimps on the upper inside prong. These two crimps rest on the yarn supplying the



CROSS SECTION SHOWING THE TENSION DEVICE AND THE METHOD OF ATTACHING IT TO A SPOOLER.

tension to the yarn which passes under this prong. To the lower prong of this hair pin shaped spring a weight is attached which moves in a groove so as to allow the tension to be adjusted to meet all conditions by simply moving it along this groove to the right place and then tightening it in its position.

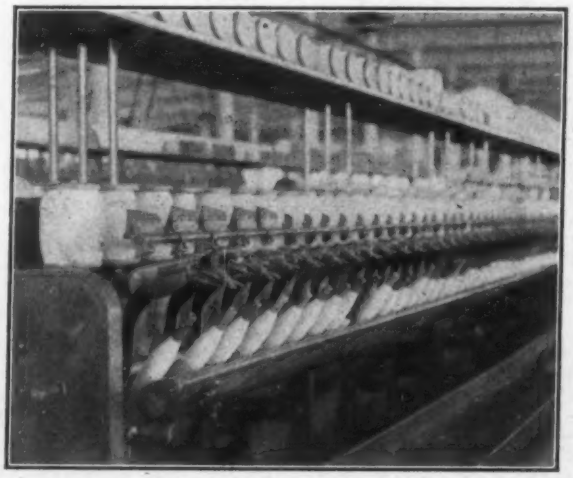
In the drawing of the device, the thread is seen coming from the filling wound bobbin and passing between a flat steel plate D set into the main iron casting which holds the device together. The steel spring shown at C is attached at the center of one prong of the spring to casting B which swings vertically on a pin which is shown in the drawing. The movable weight, A, which can be adjusted at any point in the groove of the casting has already been referred to in the preceding paragraph. Thus B furnishes the pressure which is applied on top of the spring C, and this in turn results in a steady tension on the yarn. The two



YARN PASSING THROUGH TENSION DEVICE TO SPOOL.

crimps in the lower prong of the spring furnish the points of contact with the yarn and are rounded, so that the contact is so slight that there is no chance for the collection of waste. The points of wear on the device, of course, are the steel plate D and the steel spring C, both of which are detachable from the rest of the device and can be renewed.

The yarn is kept under the center of the spring by two ear-shaped pieces in front and a bent wire guide in back. To eliminate wear on the surface under the spring over



A SPOOLER EQUIPPED WITH THE TENSION DEVICE.

which the yarn runs, the steel plate D was inserted. This was done because with the older methods, tension was obtained by running the yarn over strips of felt which gave friction to the yarn and some tension but they were worn through in a short time and had to be renewed every few weeks. This meant trouble and delay which is a big

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Commercial Paper and Loans eligible for Rediscount with Federal Reserve Bank	90,881,712.95		Discount Collected but not Earned	1,304,170.42
		$171,246,358.02	Reserved for Taxes and Expenses	1,070,916.20
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Call and Demand Loans	$11,666,965.05		Acceptances by this Bank and by Correspondents for its Account [after deducting $582,042.93 held by this Bank]	19,781,143.58
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Due 30 to 90 days	22,452,211.17			
Due 90 to 180 days	23,940,166.68			
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United States Obligations		4,932,934.04		
Other Investments		6,745,442.18		
Bank Buildings		514,567.05		
Customers' Liability for Acceptances by this Bank and its Correspondents [anticipated $3,244,396.03]		16,536,747.55		
TOTAL RESOURCES		$275,195,078.47	TOTAL LIABILITIES	$275,195,078.47

factor. In fact, this point alone is the one that makes the new device much desired, for it eliminates this trouble entirely and still gives the desired tension to the yarn through the spring alone, independent of the steel plate.

There have been many tension devices on the market but in time they developed points which made them impractical and in most cases a different device was tried. The chief trouble with devices of this character has been the fact that they either gave too much tension, causing the yarn to break at times, or they gave too little tension and caused soft spots on the spools. In cases where soft spots were formed on the spool, when the spool was taken to the creel to be wound into the warp beam, these spots caused the thread to bury itself in the adjacent soft threads, making it difficult to find the ends of the thread and the spool of yarn frequently had to be discarded as waste.

The drawing shows the bobbin placed upright on a support which forms a part of the device. This is the only way in which a filling wound bobbin can be placed because it is wound with yarn in layers extending diagonally from the surface of the bobbin to the outer edge of the circumference of the yarn of the filled bobbin.

The warp wound bobbin is wound as every mill man knows, like the thread on a common spool, that is, first one layer is wound on the bobbin the entire length before the next layer is wound on. Because of this the warp wound bobbin has to be placed in a cradle where its weight, as it is being wound, keeps the yarn taut. The spool cannot be run at a high speed because this type of bobbin will jump out of its cradle. Given a suitable tension device, the filling bobbin is much preferred because the spools can be run at a greater speed providing the tension is kept constant and even all the time, a condition which this new tension device seems to meet.

Many experiments have been made by mill men and others in an effort to produce a suitable tension device for filling wound bobbins, and the opinion has often been expressed that warp wound bobbins would be discarded from general use should a suitable tension device ever be brought out, because cotton mill men all know that the speed of machines can be kept up and the output of the machine increased by using the filling bobbin, in place of the warp bobbin, if the tension is satisfactory.

Another advantage of the filling bobbin is the fact that if a drop of oil gets upon it from the machine the yarn soiled is less in amount because of the method in which this bobbin is wound. The warp bobbin if soiled with a drop of oil in one spot will cause several layers of yarn to get soiled, because one layer is just under the succeeding layer and the top layer becoming soiled quickly soils the layer next to it in a short time.

After a six months' trial in several mills the new tension device has shown that the spoolers can be run at thirty per cent greater speed thus increasing the output of the machine just this much, and it does not require any more work on the part of the operator of the machine. The expense of putting the new device upon machines is thus offset in a short time by the increased production with the added advantage that all wearing parts are made of steel. In case new parts should be needed they can be put in place in a short time and renewed very easily because of the simple construction which makes them easy to get at in case of adjustment or renewal.

W. A. Kimball (Mass.)

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Two Questions from France.

EDITOR COTTON:

As a subscriber to COTTON, I should like to present the following two questions for discussion by contributors in the Practical Discussion Department:

1. There are two rows of spindles on a fly frame. Is the twist per inch in the roving the same on these two rows? On this side of the Atlantic, some competent men think that the twist per inch is greater in the second row of spindles. What do our American friends think about it? If this is correct, why is it so?

2. On a carding machine, when the front plate is nearer the cylinder, you get less flat strips than when the front plate is farther from the cylinder. Why is this so?

I hope some of your interesting contributors will submit opinions on these two questions.

G. C. (Vosges, France.)

Trouble Makers.

EDITOR COTTON:

There are many men in the mills today who trust their section hands too much, thinking that these men are on the level, as they should be. Sometimes, however, an overseer wakes up to find that his position is threatened by such men. By this I mean that some men in charge of departments let their section hands keep the time books and also let them do the "hiring and firing" in their department. This, to the writer's mind, is a practice that no overseer should brook in the mill, for there is many a good man discharged because of some misunderstanding between him and the section hand of which the overseer in charge is unaware, and thus the mill loses a good man.

A section hand who is given such authority as indicated may have some friend for whom he desires to land a job in the mill and often the result is that some good worker is discharged for the sake of making a position for this friend. This is a fact, for I know of such deals being pulled off in mills and many a time does the man who is doing it get by with it. It is a pity that some overseers should let their section hands get away with this kind of stuff.

I have been an overseer for many years, and have always stood by my assistants; have given them the benefit of the doubt in many cases, but if ever I should discover that any man under me was "riding the help" and I found out that he was causing ill feeling among the operatives, I wouldn't stop until I had discharged him, as it is considerably easier to hire one section hand than it is to get good work out of a room of dissatisfied workers.

I believe in using each and every worker alike, regardless of age, size or creed. This I have found in all my years in the mill to be a good policy. It has never failed. I always get good results and honestly believe that no one who has worked for me and leaves my department will say a word against this policy.

I don't believe in playing favorites, and I detest people who carry tales; these don't last very long in my employ as I term them trouble-makers. I once knew of an overseer who trusted some section hands more than he trusted others, and managed to make a pet out of one. This meant that whatever this section hand heard he would in turn relay it all to the overseer. He was what I term a spy—not a section hand.

This section hand had charge of all the spoolers, that is the repairing end, and he also kept the weight of all the yarn sent to these spoolers, and at the end of the week he would hand the weight reports to the overseer. There was one favorite among all the spooler tenders and this meant more weight for her whether she earned it or not; anyway, she always drew more pay than any of the other women.

The overseer never got wise to this scheme, as he always trusted this man and thought him on the level. But as luck would have it, this man was taken sick and out for a week and another man was put in his place. Things went along as fine as silk the first day, but the second day brought a complaint from this certain spooler tender, as she missed the extra weight which she had been getting through the regular section hand who was sick. As a result, she lost her position. Here's how it was worked:

The new man counted 283 spools taken off her machine and after these were weighed she was given credit for 283 pounds, an average of just one pound a spool, that is, they were pieces when she received them. The girl found a change in the weight and went to report to the second hand but when she explained things to him she told him that the exact number of spools taken off of her machine was 287. The new man suspected something and took the truck of spools directly to the overseer's office where they both counted the spools over and found the number to be 283. The overseer marked this number down on his pad, left the truck near his office and started to take a look around the room.

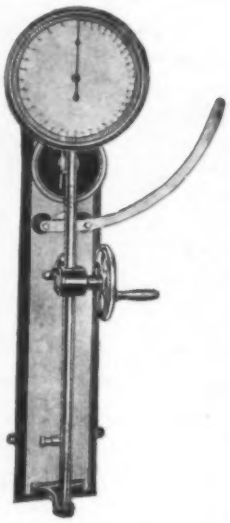
While the girl was explaining things to the second hand, the overseer came by her spooler, and she left the second hand and started to tell the overseer all about the spoolers. After listening to all she had to say, the overseer took her to the truck where she had the pleasure of counting the spools over again, and found that there were 283 on the truck. That was how she lost her job.

The following week found the new man permanently in charge of the spoolers, for when the other man came in he was told that his services were no longer required, with the result that there was a few more dollars left in the office each week.

T. A. B. (Mass.)

The Peaslee-Gaulbert Company, of Louisville, Ky., manufacturers of the well known line of "Pee-Gee" paints, have announced the opening of a branch office and warehouse, at 228 Marietta Street, Atlanta, Ga., where a full stock of the company's products will be carried. Hugh S. Gardner, who has been connected with the company for the past 16 years, the past 10 years of which have been spent in traveling Georgia, will be the manager of the Atlanta office with Gilbert Little as assistant manager.

A new store has been opened at 33 South Forsyth St. Atlanta, Ga., by the Southern Cotton Oil Company to handle a complete line of "Sco-Co" paints, enamels, varnishes and stains, and roofing materials, with H. D. Shackelford, who has been connected with the paint business for twenty years, in charge. This store is the first of a chain of retail stores to be opened by the paint products division of the Southern Cotton Oil Company in the principal cities of the Southeast.



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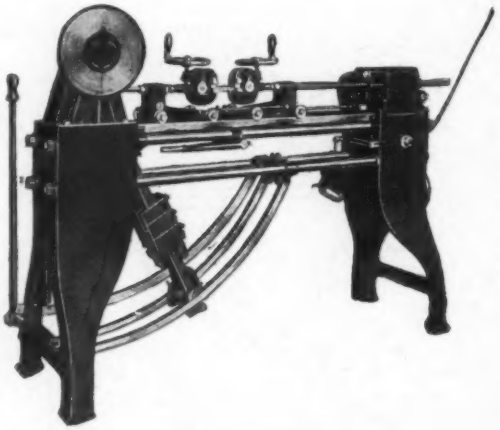

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1255936 Feb. 12, 1918
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1282644 Oct. 22, 1918
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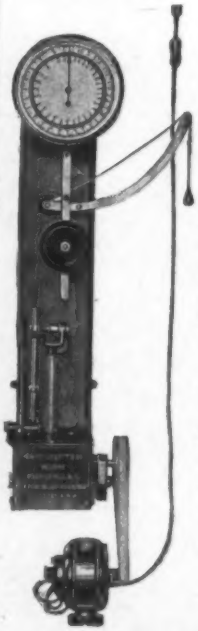

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A Lighting Suggestion for Colored Work.

EDITOR COTTON:

Proper lighting is a necessity in any kind of manufacture and the manufacturer who disregards its importance is certainly playing a penny wise and pound foolish game.

The spinning of colored yarn requires better light than white for the obvious reason that the yarn does not stand out in contrast with the dark machinery on which it is manufactured. This situation can be greatly remedied by an abundance of well diffused light. If a mill has a steady production of colored yarn, it will be found very desirable to have the thread boards of spinning frames painted white. This will serve the double purpose of a white background for the colored yarn between the rolls and the thread guide, and also will reflect the light upwards against the front rolls and better illuminate these where the joint is made in putting up an end.

It is not necessary to go to the limits some manufacturers of machinery go when they have every part of every machine painted white. However, this certainly is conducive to efficiency in other ways than better lighting, for it not only increases the self respect of operatives, but greatly stimulates them to cooperate with the management in cleanliness and sanitation. If cotton machinery is bought for the sole purpose of handling dark colored yarns, it would be desirable for the manufacturer to use white enamel and paint on all painted parts. The economy will not warrant this on used machinery other than the thread boards and directly under the rolls, which should be white. White yarns, though, require dark backgrounds and it is not advisable to paint machinery white that is used in spinning white or light colors. T. H. I. (Ga.)

Suggestions on A. L.'s Picker Problems.

EDITOR COTTON:

I will try to give "A. L. (Ga.)" my idea about the trouble with his card sliver varying without first asking for any of the details. If I were put into the room to adjust this ailment the first thing I would do would be to start at the mixing of the cotton and see that my stock was well blended with the different grades of cotton, and so mixed into my hoppers that all bales were represented, and I would mix as many as ten bales at a time, preferably the day prior to using the cottons if I had sufficient room to do so.

Then at my breaker hoppers I would have the hoppers fed evenly and not filled too full at certain times and then at other times run nearly empty. It is a common thing, where hand feed is used, for the operative to fill the hoppers as full as they will stand, and then go off and sit down and wait for them to run almost empty before he starts again to refill them. This method will cause such heavy and light places in the laps that the eveners will not take them up sufficiently so as not to show some unevenness.

On the aprons of the pickers I would have the laps split up so as to have a half-full and a full lap alternating on the aprons. This will give two full laps, and two half-full laps and in this way the aprons are balanced at all times and the weights are that much more even. Then watch the mixing of the white cotton waste from the carding and spinning rooms and feed it in gradually throughout the day.

Take particular care about the cleaning and oiling of the pickers. I will not go into the details of just how and when to oil, because it's not necessary; just keep them well oiled. I will, however, say a little about the cleaning. The machines should be wiped off on the outside twice per day, the inside around the beaters and fan shafts should be wiped twice a day, the motes, etc., taken out once a day, and floors given careful attention.

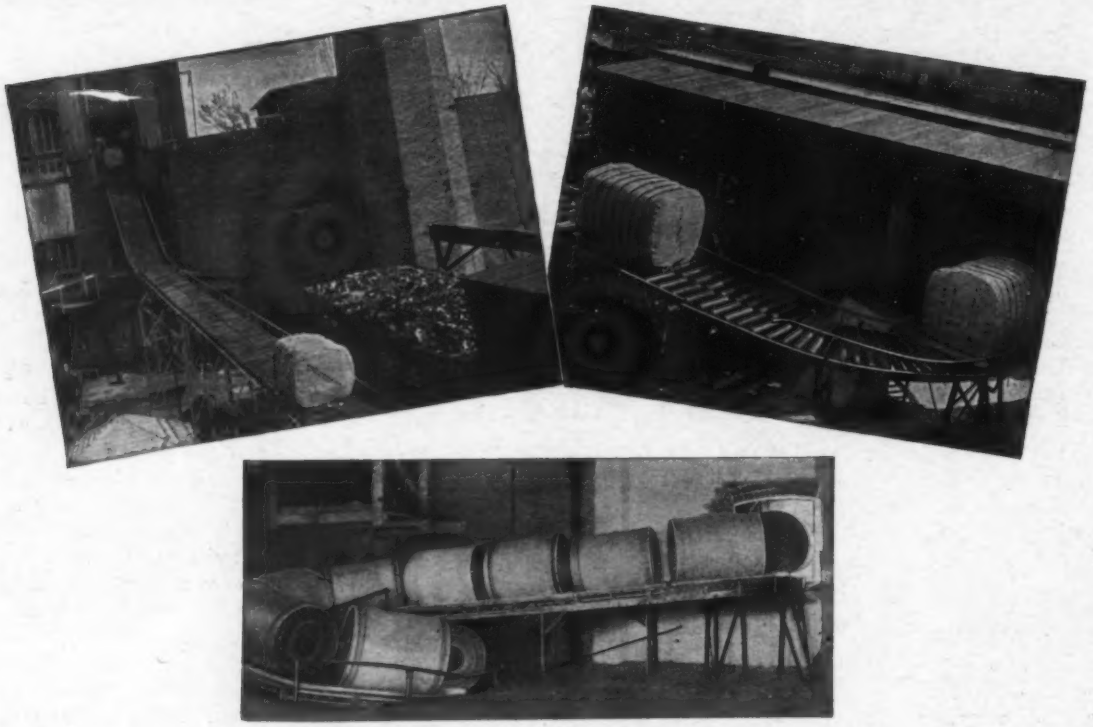
All dust flues and screens must be kept cleaned or the draft cannot do its work in spreading the cotton evenly on the screens. Laps on the feed rolls must be watched. Bad teeth on the feed motions will do damage, especially in turning the screens if there is a bad place it will cause the screen to pause at times and when it pauses it means a thick place. Then the blows that the cotton is receiving from the beater is another important thing to look into, and it is something that can be easily experimented on and found out which setting is the best.

The eveners, and the evening motion, should at all times be kept clean and well oiled; also see that the little pivots are free from friction; the pedals under which the cotton passes into the feed rollers should be oiled occasionally and cleaned, so that when a lump happens to come through they will act immediately on the evening of the lump, or vice versa on a light place.

The next important thing to keep up with is the draft of the pickers. See that the fan speed is great enough to control the flow of the cotton. If the beater draft is too strong it will cause the cotton to be thrown onto the screen instead of being drawn on them and spread by the suction of the fan draft. Adjust the draft so that the damper doors on the inside of the machines at the end of the screens may be kept wide open, as this space is for taking out foreign matter from the cotton as it is being spread on the screens, and not to adjust the draft or to pull up and try to remedy split laps. The beaters furnish some draft, which, by increasing the flow of air (draft) by the fan, assists in getting the benefit of what draft the beaters make. This is a dangerous place for uneven work if this beater draft is not controlled, at the same time it is nice working when it is controlled, but bad when it is not.

Transferring laps from the pickers to the cards must be done in a way not to damage the laps more than can be helped, and should there be a damaged place it should be torn off. In creeling in new laps on the cards, have the ends placed very evenly, and in the running out of the old laps I prefer about twenty-four inches torn off before the new one is put on, owing to the condition of the end of the old one. Examine the lap sticks and see that they are straight, also inspect the gears on the cards that have anything to do with the feeding of the cotton. I have had the large bevel gear, that contacts with the small feed gear, to get worn or sprung so that at intervals it would skip in turning and cause thin places. Sometimes, when everything was working free, it would not skip for a period, but when a load was put to it, from the bearings getting dry or gears getting choked, it would skip.

The settings of the cards must be done evenly, what ever the settings are, let "A. L." set the points to as close a gauge as it will stand on the cotton and the clothing of the cards, taking into consideration the fibers and not set so close as to injure the staple. Take out all the fly the work



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will stand, or the goods will allow, splitting the difference with white cotton. Try to get all the motes and other trash out with the mote knives, and watch the setting of the screens and the flats so as to get a good circulation of the air current. The back and front knife plates play an important part in the circulating of the air. The stripping of the cards is as essential as putting on new laps. I once took a card room where the former overseer had neglected stripping the cards and it had a bad effect, so I told the assistants that if it was a case of which to do, stop a set of roving frames or skip one stripping, to stop the roving frames and get the cards stripped every time. The number of times per day to strip can only be judged by the stock.

Contributor No. 14.

Cotton Carding.

EDITOR COTTON:

This article is not intended to instruct or teach the boss carder how to run his cards, nor will it carry any technical terms more or less hazy to the man who is coming up, but it is intended to help the man who aspires to become an overseer of carding. The magazine COTTON is widely read by men in the cotton manufacturing business, and as there are any number of young ambitious men in the mills in subordinate executive positions who are looking forward to the time when they too will take their places as overseers and superintendents it is thought that this letter on carding might help them. The writer was led to write this treatise after seeing two young men in close conversation and argument with a magazine in their hands, in a New Bedford mill, and looking to see what argument was being waged, I found it was under the caption "How Other Men Manage." It is a fact that there are several men in minor charge in the cardrooms of most mills—while there is but one overseer. These men in minor charge are naturally looking forward to their first job as overseer, and they are always studying and anxious to get straight facts about their work. It is also a fact that a great many second hands of speeders get to be overseers without any training at all on the cards, and they have to learn the fine points after getting the job. It is for any such readers that I have prepared this letter.

The draft between the lap on the card and the feed rollers should never be more than is required to hold the lap in a straight manner, otherwise, there will be considerable irregularity in the amount of cotton fed to the licker-in and consequently the cylinder. Lap rollers should always be corrugated—never smooth. Smooth lap rollers will cause slippage of lap, fluctuation, and irregular drafts, no doubt a greater draft than estimated. Corrugated lap rollers will prevent this evil at this point.

There is a variation of draft between the feed roller and licker-in under the best of conditions. It is a customary measure to alter the speed of the feed rolls whenever a change of draft is necessary. That of the licker-in is not interfered with, the speed generally being about 50 per cent of that of the cylinder. Any alteration of the speed of the licker-in consequently alters the rate at which the fibers are treated by the licker-in needles and, therefore, controls the length of duration of combing action upon fibers presented to the licker-in.

The draft between the cylinder and flats is generally regarded as fixed for different classes of cottons. Alterations of drafts at this point are generally made by varying the speed of the flats. The speed, or rate of movement of the flat, mainly governs the action of the card cylinder upon a given number of fibers, besides governing the amount of clean carding surfaces introduced, therefore it is entirely proper to regulate the speed of the flats as the circumstances of carding warrant. With dirty, clogged, matted, neppy cotton, a higher flat rate is expedient. For low cottons, such as Indian, low American, etc., the speed of the flats should be about double that for good clean American cottons, as also on Egyptians.

The draft between the cylinder and doffer is also of a varied character, and there is a tendency to alter the draft at this point rather more than is expedient. There is a tendency to regard the speed of the doffer as subordinate to the count of sliver.

The draft between the doffer and calender is varied but very little. It is generally varied to keep the web coming from the doffer in such a position that there is not too much "sag" nor too much tension.

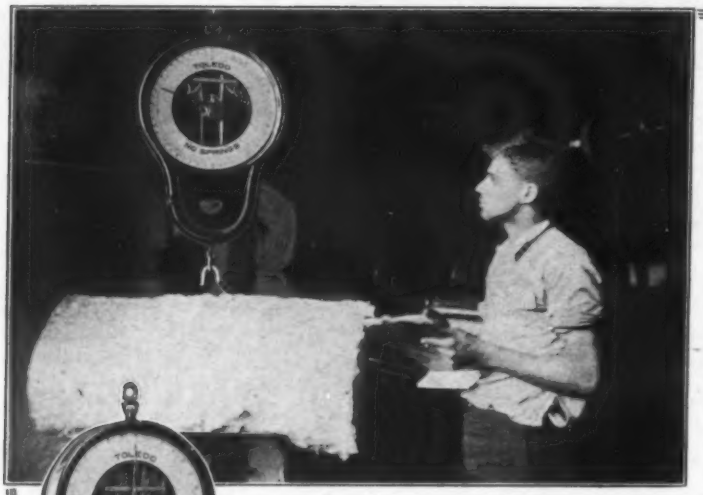
When circumstances arise demanding a change in the output of the card, it is well that a general knowledge of the conditions and limitations of each part mentioned should be secured, so that the best results will be accomplished. Bear in mind that the greater the number of fibers treated the greater tendency there is to strain the fibers. Association with the work as well as close study should be made to get the best results.

The greater the contrasting speed of the carding surfaces, the longer the fibers are desired to remain under the carding action and influence. The greater the length of the fibers, the longer the duration of the carding action, for the simple reason that the card has greater difficulty in separating the fibers. The more bulky or numerous the fibers presented to the carding action, the greater is the tendency to roll and strain the fibers. This is excessive in some cases. Fibers should never be presented in such volume as to crowd the flats, because there would be a tendency to raise the flats, as it were, taking the weight of the flats off the bend, the cotton fibers passing under the flats bearing the weight and thereby being considerably damaged and weakened.

Carding surfaces should never be overcrowded, as "Wash" points out time and again, in his letters in these columns. This flat lifting tendency increases as the crowding becomes intense. This is also apparent by the increased power required to drive the card. These conditions are more likely to arise when carding more or less long cottons, than when carding the shorter cottons. Increases in power required to drive the card may generally be taken as an axiom that there is some overcrowding taking place, consequently straining the fibers, and weakening the resulting yarn.

The functions of the licker-in are to comb and straighten the fringe of cotton fibers presented from the lap, also to eliminate as much as possible the foreign matter, and to carry forward the fibers treated within the range of the card cylinder action.

The duties of the card cylinder are to take the fibers from the licker-in and carry them within range of the carding action of the flats. The flats in turn arrest those fibers *which are not straight*, the straight fibers being car-



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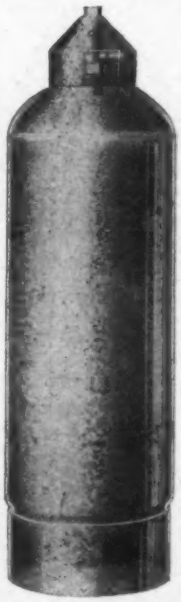

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ried forward under the rest of the flats. As the card cylinder revolves it is continually coming into contact with those fibers being held by the flats, and which partially project into the carding action of cylinder. As these fibers are gradually straightened out they are taken away from the flats by the cylinder card clothing points and carried forward to be deposited on the doffer, or re-arrested by another flat *if not straight*. The flats arrest the super-abundance of fibers during the early part of carding, that is, those at the back of the card, and these are, therefore, being continually held in reserve and being gradually brought forward by the quickly revolving cylinder until by the time the flats are passing well over the bend, the fibers are more or less evened up, and the super-abundance of fibers are gone. The heavily crowded flats are always the first in action at the back of card.

The duties of the flats are to receive foreign matter, arrest and straighten fibers otherwise than straight, and not in line with the carding movement of the cylinder, and to present those uneven and matted fibers to the carding action for a definite length of time or period. Therefore the ability of the flats to arrest foreign matter, matted fibers, and to retain them; at the same time presenting such fibers to the carding action, depends on the efficacy of the points of the flats, and the number or quantity of these points available.

As demonstrated by the old fashioned hand carding, numerous sharp points of wire, accompanied with small but reasonable spacing, are the best active agents for collecting the foreign matter in raw cotton, and disentangling matted bodies of cotton fibers. Therefore a clean supply of these wire points should always be coming into action, and at sufficient speed to care for the work to be done. If there were not sufficient clean flats constantly coming into action the imperfectly carded cotton from the licker-in would be carried forward by the card cylinder, and in passing the crowded flats would absolutely imbed those fibers already engaged by the flats. Here again comes the question I spoke of before, and which has been a question of argument in your columns time and again, the fibers would consequently raise the flats, take the weight of the flats off the bend, and strain, roll, break, and otherwise damage and weaken the cotton fiber. This is a fruitful source of neppy yarn, showing up badly in fine lawns, voiles, organdies, etc., and weak yarn, according to the degree of overcrowding, and making for poor spinning.

Care should always be taken that the proper knee or inclination of the card and flat wire is preserved, otherwise imbedding will result.

Stripping brushes should always be thoroughly cleaned after every card being stripped, and neither comb or brush should be set too deep. The card and flat wire should always have a fine keen point, and should be maintained constantly in this condition.

Familiarity breeds contempt, but there should *never* be contempt for the care required to keep cotton cards in first class condition. There is absolutely no question at all but what we, on the average, ought to take greater care of our cards than we do. Regardless of the type of mill. In England they have always insisted on very skillful help being employed on the cards. Do we? If not, why not?

It will be noticed that all the fibers are not arrested by the first flat coming into the carding action. For the sake of experiment, pass a little dyed or colored cotton in at the back of the card. It will be noticed that it makes its appearance, a few fibers here and there, at the front of the card, and on the last flat in action, almost immediately. Therefore it would seem that the best way to find out the requisite speed of the flats would be to use the card strips as an index. However, in view of this fact, it would also seem that from the time the fibers are arrested on the first flat coming into action, 40 minutes ought to be more than sufficient for the selection of all desirable fibers received by the flat when occupying the first position on the bend. The speed of the flats should be adjusted so as to give the lightest "strip" to strip in a good manner and satisfactorily.

To adjust the per cent of strip by manipulating the front stripping plate is entirely wrong in principle. There is really only one proper setting for that part, and that is as near to the flats and cylinder as practicable. Increasing its distance from the flats will cause detachment of portions of the entangled fiber and foreign matter selected in the carding action from the flats as they move out of action, and will undoubtedly pollute the work accomplished by the card cylinder and flats up to that point.

When considering the speed of the doffer, its duties must be kept in mind. Its duties are to remove fiber from the cylinder. The more efficiently this is done, the better. If the cylinder is only partly cleared of the fibers, its influence on the carding action is restricted, that is, its beneficial influence is more or less spoiled. This is understood by the fact that only a part of the card cylinder's surface is available, as more or less of its wire points contain fibers that would have been deposited on the doffer. The doffer should be cleared as completely as possible, and its surface rate should be as high as is practicable and efficient.

Owing to the wide divergence of local conditions, the quality of cotton treated, very light slivers, poor staple cotton, bad laps, poor selvages, drafty rooms, bad combs, poorly constructed sliver casements etc., neither speeds nor settings can be given accurately, but only approximately. What the writer would like to see in COTTON, and what he knows would be more than welcomed by most of our young men is a series of articles giving personal experience on certain cottons, put through a certain type of card, giving all the speeds, settings, grinding care, help arrangement, count of sliver and so on. Also in each article an explanation of why that carder was satisfied he had the correct settings, and an explanation of his experiments leading him to his present satisfactory settings. Bal. (Mass.)

The corporate name of Rickard and Sloan, advertising agents, has been changed to Rickard and Company, Incorporated. Their address is 25 Spruce St., New York City. Continuing the policy which, to a large degree, has been responsible for its uninterrupted growth, the company will specialize in industrial and technical advertising.

The Chicago office of the Uehling Instrument Co., of New York, manufacturers of fuel saving equipment, was moved May 1st to the Great Northern Building, 20 West Jackson Boulevard. Walter C. Lange, who has been appointed manager of this office, has had considerable experience in this field with other concerns. He is a member of the A. S. M. E., and a graduate in mechanical engineering of the Stevens Institute of Technology.

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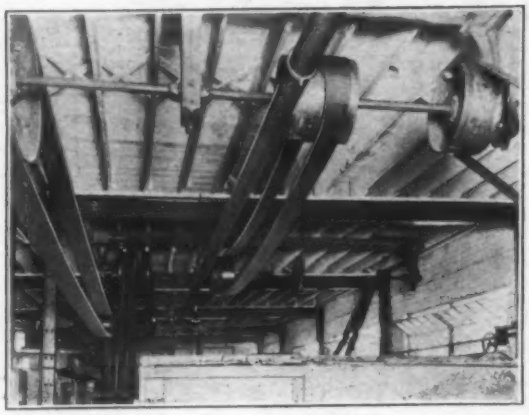

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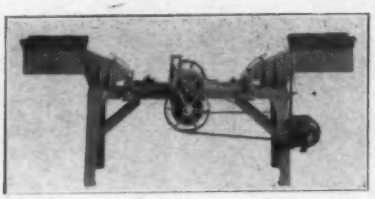

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Four of the largest industries in America, each leaders in their group, announced price reductions during the month of April. They set the pace, others must, of necessity, follow.

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We took the toboggan, reached the bottom, and have started back up.

We have all had our trials, troubles and tribulations, the past six months. But these have only made us the stronger to do the work necessary to be successful in the future.

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CHARLOTTE, N. C.

Even Running Work.

EDITOR COTTON:

Commenting upon James Robertson's article, "How Even Is 'Even Running Work'" in the April number, I would like to put this article side by side with the whole analysis of the picking process, as written by "A. B. C. (R. I.)," which has appeared in several recent issues. The general theme of "How Even Is 'Even Running Work'" is that the uneven places in the web produced by pickers in general are the foundation of all trouble in the mill. This coincides exactly with the results obtained by "A. B. C. (R. I.)."

I agree with both these writers inasmuch as what they have found in tests and general description of methods to overcome the troubles of all mills will eventually be recognized by mill men as their only solution for even running work. It seems strange that with these results showing upon the surface that there isn't someone among the thousands of textile workers and machinery builders who has the faculty to invent and apply some mechanism which perhaps might be simple in construction and easily applied, to eliminate this positive source of unevenness. How much better the yarn would break and what a difference there would be in the strength and texture of the fabrics if we were assured of a positive evenness throughout the several different processes in the making.

As a rule, I think, the average man takes the conditions around textile mills too much in a matter-of-fact sort of way, and leads himself to believe that because things are made or are running in such a way, they should never be readjusted or the design of any machine changed, and should be left to go forward in the same continuous channels as per the first installation.

There is no question in my mind but that there are hundreds of far better ideas of constructions and adjustment for the manufacturing game if the fact of assurance, of cooperation, of the man-to-man idea could be established. For instance, when one happens to open a conversation with most any person around a textile plant invariably this conversation will drift to the conditions of the plant where the conversants are, and it so develops that some new and some old questions arise, and if, in many cases, these ideas were given a chance to be put into practice without a prejudical attitude, many plants would eliminate many of the evils of manufacturing. It matters not how efficient an operative is, or could make himself, if the work runs poorly or machinery adjustments are so applied that a machine is making bad work or work that could be improved upon.

The foregoing of course doesn't signify that the one in authority is losing by not trying all the different suggestions made to him, but it does mean that if he doesn't awaken and become alert to all conversational suggestions that he meets up with, there will be those that he should try that will pass by, and not only that but the person from whom the important suggestions come will see that it is useless to bring up those things that are essential for they are never used, and therefore they refuse to offer any other suggestions, or, in other words, they will be disheartened to that extent.

The evenness of even work is a constant diameter absolutely guaranteed from each machine that invariably does *not* appear in most of our mills. The evenness is the trouble of most mills. Without evenness there are no end of troubles traceable from the salesman to the machine tender who has charge of the opening machine. When one finds cloth that is light or heavy, when one finds beams light or heavy, or spinning sizing light or heavy, or roving off the fine speeders shady either way, and sizing that happens to be taken from any of the several places that sizing could be taken from in a card room back as far as the picker or breaker picker, the action performed for its elimination is "change the gear to catch it and size it again in awhile and if it does come back put the gear on again that you took off."

Now my candid opinion of gearing in any mill is this: if after one has determined the weights and drafts that are actually required and we find that this machine and that machine calls for a certain draft gear we naturally put said gear on and expect the machine to produce what the figures say it will, do we not? If we find that it doesn't show in sizing what the figures say it should, the universal alibi is—"change the gear and watch it." Now if one actually wants standard diameter yarn inch for inch, I say, put the draft gear on the machine that actual figures call for, and if the correct results do not show find the trouble, which can, as a rule, be traced to the hopper of the breaker picker where thin places and bunches or thick places begin the unevenness trouble.

What a tremendous amount of talking, labor, worry, anxiety and even overseers' and superintendents' positions could be saved if the picking process of most mills could be renovated to meet the even requirements that Mr. Robertson didn't find or the actual results that "A. B. C." knows could be accomplished by the suggestions forwarded. What a difference in the texture of cloth or fabrics for tires there would be if every machine had its correct gear on, and every machine producing that yarn or sliver or lap or roving that would carry a stamped guarantee of evenness. What greater production, how much less waste, what an elasticity the yarn would have, what greater wages by piece work, what greater profits and what greater harmony!

Tom (Mass.)

A Weaving Record.

EDITOR COTTON:

Some time ago a mill man contributed an article to one of our southern publications in which he said he desired to compare records with other mills as to the exact number of yards of print cloth produced in an exact number of hours. He stated that practically all mill men were accustomed to running their looms overtime a few hours each week, making a total run of say sixty hours for the week but calculating the production on the basis of the regular fifty-five hours per week which the entire mill was supposed to run. In this way, practically all mill men claim over 100 per cent production, when, as a matter of fact, it is impossible to make 100 per cent, as every one knows.

The writer has been making some investigations at various mills as to actual yards produced in an exact number of hours the looms were run, as suggested in the article mentioned. Accordingly, for the benefit of all those who may be interested, the accompanying record is submitted as being the best record the writer has been able to find for a solid year's run on print cloth, and especially on

BLEACHERS!

Would you install a process that would be better and cost no more and for which no new apparatus was needed?

Would you prefer to have no "seconds", no chance of damage, one-third the labor, water and coal, the highest elasticity and softness?

On cottons as well as on woolens and silk?

All this you get only with the Peroxide Bleach.

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"eighty square." The mill making this record is located in South Carolina and the name may be obtained by anyone interested.

Following is the record:

Total number of looms, 560.

Total number of days operated, 308.1 days.

Actual number of hours operated by weavers, 3,081 hours.

Actual number of hours operated by loom fixers, 209 hours.

Actual number of hours operated altogether, 3,290 hours.

Total number of yards produced, 5,802,178 yards.

Actual percentage for 3,290 hours, 94.47 per cent.

Percentage of seconds on total production, 3.58 per cent.

Number of picks per minute, 160 picks.

Kind of goods made, 4.00 yard, 80 x 80 print cloth.

Cotton used, 1-inch staple.

Warp yarns, 30s single carded.

Filling yarns, 40s single carded.

Variation in weight of goods, 3.98 to 4.00 yards per pound.

Percentage of production based on 60 hours per week, 100.87 per cent.

Weaving cost, .0139.

In explanation of number of hours run, please note that at the time this record was made (the year 1915), all mills were operating on the sixty hours per week basis, and out of the total run of 3,290 hours, the looms were run by the loom-fixers 209 hours. This was due to the fact that the South Carolina law expressly prohibited the weavers being allowed in the mill for over sixty hours per week, and the 209 hours represents 45 minutes each day during the dinner hour and a few minutes extra in the morning at starting time when the looms were operated only by the loom-fixers.

I am personally interested in this record because it was made on our "Duplex" flat steel harness. I would like to hear from any mill which has a record equally as good or better, whether the harness used be ours, or any other kind.

Hampton Smith (S. C.)

Fixing Hosiery Loopers.

EDITOR COTTON:

According to the writer's idea, in the manufacture of hosiery from start to finish there isn't a single process through which the stocking passes where it gets such a close call to being ruined as in the looping. Why? Because when the stitches have been put on the looper points the stocking must pass under a trimmer. These trimmers have two blades and these blades must be kept sharp in order not to tear any of the stitches. The trimmer blades must be low enough to cut close to the stitches so the circular brush can clean all the lint from the stitches making the stocking the same as raveled. Occasionally a corner is pulled out and that may be because the fabric guards are close to the point ring. Dull blades will also do this.

The corner stitches are very tender and easily broken. And if the trimmer blades are low enough to get desired results and a stitch is put on crooked, look out stitch, for the blades will certainly cut it. The stitches are egg-shaped and naturally the looper stretches the stitches upward.

Some mills use a loose course and this should be made very small.

The looper fixer always has something to do. He has more to do than the average fixer. He must keep points in line, and keep blades sharp. Loopers are very delicate and require close adjustments. One of the best ways to do is to watch the looper run and see what does the damage before adjusting anything. The fixer who can keep his cost down on parts is the machine fixer and machinist combined. But there are only a few machinists in every hundred machine fixers. Lots of times a part must be removed on account of a little wear, and a new one could be made, but unfortunately the fixer isn't capable of making the part though he may be a first-class fixer.

My experience has taught me the foregoing, and when I first started to fixing the superintendent told me when I was trying to patch up a machine not to use a worn part but to make one. Ever since that day I have practiced that. A man can get real pleasure out of making his own parts, and can sometimes save the company money besides.

I shall deal next with skipping thread breaking—the causes and the remedies. L. G. (Ga.)

Some Card Details.

EDITOR COTTON:

After using considerable space deliberating upon the troubles surrounding pickers, and having probably exhausted the patience of some of COTTON'S readers, I wish, before going further, to make one more appeal for a trifle more of their time and carry each one of them through another branch of the carding department and attempt to explain a few of the things that have confronted me in adjustments, drafts, regulating speeds, grinding, burnishing, stripping, cleaning, oiling, etc.

First of all, I want to say again that unless one masters the picking department and positively assures himself of a lap-web that is entirely free from thick and thin places, he should try at least to persuade himself to see that it matters not what adjustments, speeds, care, etc., may be applied to the cards, they will never change the foundation that has already been built. Let us take for granted that the laps that have been made have been ideal in every respect and as they come from the picker-heads (to those who have an eye for refinement and neatness) that their general appearance is unquestionably a work of art. Would it not be one of the greatest savings that a department head could accomplish by simply having this work of art cared for?

Place every one of those laps upon rack trucks with one handling and that by the picker tender, after weighing. Supply enough trucks to accommodate the full supply of laps required. Then have the laps placed directly in the running position in the card with but one more handling. A lap rack upon a card is a source of much expense and extra labor. These trucks can be made and placed, when full, where it will be an easy matter for a stripper or tender to get the number wanted when needed, and the laps are not torn and ruffled by being slammed upon card racks and several yards being broken off and thrown into the waste boxes to be returned to the picking process.

By avoiding these unnecessary waste possibilities it is possible to run a picking process much slower than is the case in most mills and still keep up the general production, thereby saving one's salary ten-fold yearly. Lap conveyors (automatic) can be used with grand success in many instances, but unless laps have to be conveyed from one mill to another or from one floor to another the writer thinks there is nothing that can equal the one-handling truck system.

Another form of waste can be avoided by training a finisher picker tender to so arrange the end of the lap that is next to the rod when a new lap is commenced, that the whole width of web is tucked under the rod free from a doubling. When this lap runs out in a card, the lap stick can be removed and the end of the lap straightened to receive the outside end of the next lap as it is placed in the card from the truck.

No doubt this, to many, seems to be extreme detail, but if it is evenness, strength, economy and profit that are being sought, are not these essential details worth while?

Make a few tests upon such an item as this lap question, figure its worth and expense if allowed to be carelessly handled. Would one not like it for a yearly salary? I'll say so!

Now we will pass on and find the first problem that confronts the man in charge as we attempt to seek the elimination of troubles. The roll upon which the picker lap is placed in many instances has a smooth surface and upon each end of it there is a rack and lap holder combined that serves in many cases as a cap to the bearing that keep this roll in place. This lap holder is so constructed that when a full lap is in place, the lap rod is nearly at the top of a slot made to keep the lap centered upon the smooth roll, thus getting a frictional driving contact upon their surfaces. In a great many mills these rolls have been removed and their surfaces have been roughened, fluted or corrugated. This has been done to assure a more positive frictional drive to overcome a trouble that really belongs to the drafting in the gearing from the feed roll to the lap roll.

One will notice upon investigation that there is a tension upon the web between the lap roll and feed roll that, in the writer's opinion, is detrimental to even work. I know of course that every part of this web is combed from its adjoining part, and one might say that it is impossible to conceive any trifling break in a web of that thickness and that width, especially where each fiber is separated from the other, as they are. This might be true, but the fact still remains that if at any point in the process of yarn making we discover that there is the slightest stretch in any web or strand, and that stretch multiplied by the drafts in the following processes, is it not safe to say that we might possibly have a tremendous amount of weak yarn?

If every card has a condition of this sort whereby there is the slightest stretch of even a sixteenth of an inch, I think that we would find upon strict examination that the whole outfit is loaded with weak yarn to this degree. This gear tension, intensified when the lap becomes small causes stretch because there isn't enough weight of lap upon the lap roll to keep the lap rod in position, and because the lap rod has been moved to a point nearer the center of frictional drive and is pressing harder against the front side of the slot caused by the lap roll revolving toward the card on the top arc and because the lap automatically becomes smaller with every revolution. One can easily see that although the lap roll revolves and is supposed to take care of every action of the card from that point, that the pull of the feed roll through the tension, caused by the gear

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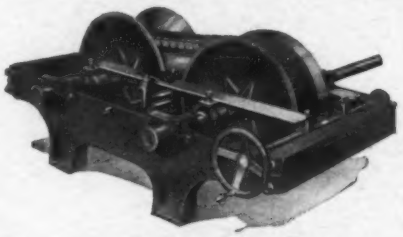

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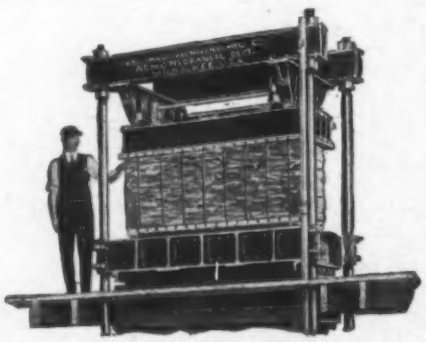

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draft, comes nearly across the lap rod center and in many cases while going through between cards we find a lap with perhaps four, five or six layers upon it broken off entirely between the lap and feed rolls. This breakage of course isn't caused every time by this tension and its surrounding factors, but in many cases I have found it to be directly caused by it, especially where the web has run to a thin place.

The action of the revolution of the lap roll causes the lap to lean to the card side of the center of the lap roll, which causes this tension leverage, and the readers will find that if a strip of iron is fastened against the front leg of the lap rod slot, in the lap bracket, leaving enough space for the lap rod to work freely as the lap decreases in size, that it will keep the lap running directly upon the center of the lap roll with a tendency to throw it a little to the back side of the center of the roll, thus giving a way out of the trouble of laps breaking off or stretching more than the tension draft naturally gives. I think that there should be no draft at all, not even a hundredth part of an inch, between the feed and lap rolls, but that the makers should depend wholly upon the flutes of the feed roll taking up any slack that might be caused there. The flutes, together with the different thicknesses of web, if the feed roll was properly weighted, would be all that would be necessary to take care of all tensions that are needed and at the same time show no stretch in the web.

Feed rolls should be attended to with utmost care, the bearings should be oiled at least once a month with a 50-50 mixture of kerosene and lubricating oil and a drop or two every day of straight lubricating oil to assure a free running roll.

With such a roll as a feed roll, weighted upon its ends and these so far from its center, with such a bulk of cotton passing beneath it by frictional contact, it can be seen that nothing should mar its action, for if this roll should have the slightest tendency to spring in its length there is a possibility of a part of the web being snatched by the licker-in and perhaps causing a jam upon the wire of the cylinder.

The intermediate gearing between the feed and lap rolls should be oiled and cleansed especially between the teeth to guarantee easy and positive action of the lap roll or perhaps there might be a slippage caused by waste between the teeth jumping two gears apart at that particular place of contact and thus increasing the draft to such a degree that the work would be injured tremendously. The same care should be exercised upon all widths of cards, but there is a greater tendency for slippage troubles found upon the wider (45 inch) cards because of the extra five inches of length in rolls, flats, etc. A. B. C. (R. I.)

To meet the insistent demands from busy men in every branch of industry for information as to the possibilities of usefulness of automatic counting machines, The Root Company, Bristol, Conn., for thirty years pioneers in their manufacture, have had compiled a very complete book called "The Census Takers of Industry" which is replete with suggestions and abundantly illustrates the versatility of these little machines in their ability to remove the human element from counting operations. The book will be sent free on request to the readers of COTTON.

Necessity of Research in Sizing Cotton Warps.

(*Continued from page* 588.)

monly met are partially saponified fats which contain free fat, soap, glycerine, and occasionally free alkali. Another group of compounds may contain some member of the chemicals compounded with dextrine, or other gums, usually with the idea of producing adhesion. It is generally admitted that the fats and oils assist the starch in penetrating and also lubricate the sized yarn through the operation of weaving. Soaps have a somewhat similar action, although they do not give as much penetration. They do have a certain amount of adhesiveness which gives strength and softness to the yarn.

Gum, of course, adds to the yarn strength and toughness as well as giving better penetration than when the plain starch is used. Here again investigation is needed to determine how to modify the starch on the yarn so as to render the yarn tough, pliable and at the same time to so lubricate it that it will easily pass through the harness and reed.

In the cooking of the "sizing" mixture it would appear that we should know very definitely what to do. But the variety of opinion that one will get by inquiry of various slasher tenders upsets this notion. Yet it is true that starch mixture responds definitely to definite conditions of cooking. Proper study of these conditions in relation to results desired should readily lead to a definite and accurate method of cooking the starch mixture. On the market are reliable practical devices for reproducing these conditions.

The method of applying the size to the yarn is apparently a simple problem on which there is by no means a consensus of opinion. Some slasher tenders will contend that their "sizing" mixture must be at a "spring boil" when applied; others, that it be very much colder. Some contend that the yarn should be immersed for a considerable period of time; others that it has sufficient strength to carry the yarn through the "sizing" mixture. The weight and condition of lapping the top roller have naturally much to do with the sizing application, and on these points there is more uniformity of opinion than on most of the others mentioned.

The manner of drying effects a final result on the yarn and should proceed at such a rate as not to mat the yarn together or make it brittle, yet it must be sufficiently dry so that the warps will not be soft.

These points need accurate determination under controlled conditions. The mechanical operation of the slasher usually gets sufficient attention, and conditions here are better than at any of the other points mentioned. I believe it is commonly accepted that the best results can be obtained if the slasher cylinders are geared at such a speed as to take up the stretch in the yarn and yet not to produce undue tension while it is wet.

All these factors are directly affected by the nature of cotton used to make the yarn, the twist of the yarn, the number of yarns used and the number of ends to the warp. Thus, with the various factors and conditions in mind it is not so surprising that mill tests in which each individual factor is not clearly recognized should frequently lead to inconclusive results. Facts obtained from tests recognizing these various factors would be of great value to the cotton cloth manufacturer.

Investigations to determine these factors may be carried out partly at the several textile schools and partly at

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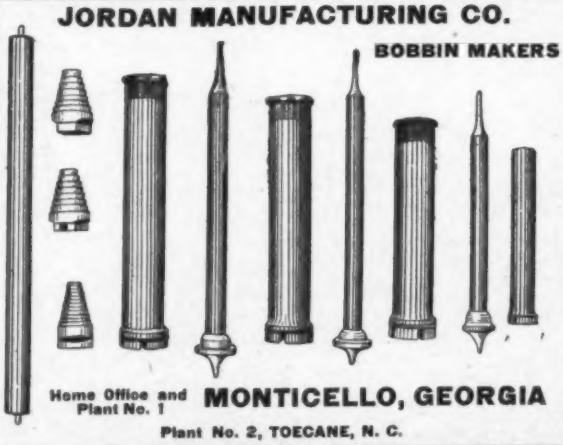

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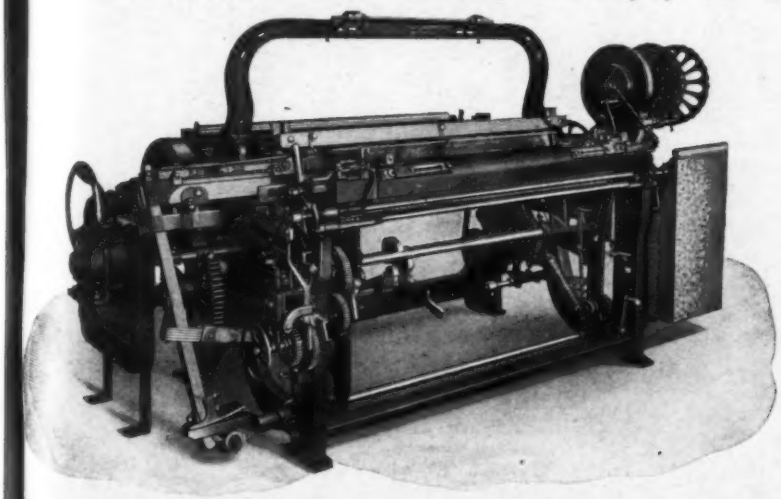
the mills. In the state of Massachusetts we are fortunate enough to have three textile schools, each of which is equipped with sufficient and proper machinery for the sizing and weaving of cotton warps. The instructing staff of these schools is, however, usually busily occupied with its regular work and cannot under present conditions give to investigation work as much time as desirable. Additional instructors might be required and I am fully convinced that the valuable knowledge thus procured by the mills and the practical view obtained by the instructors would more than balance the extra expense so incurred. A mill test is always considered of great value because its conditions are actual, not ideal. In the mill there is usually no one capable of following such an investigation who can be spared to devote all his attention to carrying on the work, and studying the results. The manufacturers of slashers and the various devices pertaining to the slasher and the merchants supplying the various materials entering into the sizing mixture could cooperate with the mills to assist in furnishing suitable directors for these tests. I am aware that this has been done to a limited extent with satisfactory results. Wider application, with proper discretion, of this cooperative idea would lead to the establishment of certain facts, the application of which would be mutually valuable.

Human nature is always fallible, but we have at hand many devices and materials that will prevent or partly remedy faults caused by the human element. The application in the proper way of those readily available opens new fields of investigation. Therefore such ideas as here outlined would benefit the textile school's staffs by the closer contact with a definite problem in the industry, while those engaged in the manufacture of and merchandizing of materials or machinery used would be able to furnish to the mills better and more adaptable merchandise, and ultimately would lead to better and more economical manufacturing of cotton cloth.

The Stafford Automatic Loom.

The Stafford Company, of Readville, Mass., has recently brought out a new line of bobbin-changing looms. The illustration shows a 40-inch plain-goods loom equipped with high take-up roll. This same loom can also be had equipped with Stafford standard medium take-up. This company now builds a complete line of shuttle-changing and bobbin-changing looms and can furnish automatic looms suited to any condition where 1x1 boxes are required.



The loom basis is the same whether the bobbin-change or shuttle-change automatic feature is used so that purchasers of Stafford bobbin-changers have the benefit of all those features which have made the reputation of the Stafford loom what it is. Improvements have also been added during the past year such as milling loomsides, boxes, etc., and cutting of gears where advisable, so that the Stafford loom as now constructed is a finer piece of weaving mechanism than ever and should more than ever stand for high quality and low up-keep cost.

The shuttle-changing loom handles cop or bobbin filling equally well, it is claimed. One of the most recent developments of this type of loom has been in the direction of automatically weaving silk goods, the tender nature of the silk fiber rendering it especially suitable for the shuttle-changing loom.

J. H. Mayes, of Charlotte, N. C., represents the company in the South; the main office and works are at Readville, Mass., and there is a branch office at Paterson, N. J.

Taking Out Twist on Fine Speeders.

EDITOR COTTON:

In the April issue of COTTON I read the letter of "S. A. F. (R. I.)" and note he terminates his letter thusly:

"All I can say to him ("Wash") is this, those 28 frames of 192 spindles each that produced 1,316 hanks in 58 hours did not have any tight slides or lifting shafts."

He should have added also, the same frames never had any tight ends.

Now, if "S. A. F." and "Tom (Mass.)" will take the trouble to look up my letter in the February issue, on page 301, they will find that I said, "Let him lift any bobbin gear and turn it back to cause slack, and then start the frame. If the slack is taken up immediately, something is wrong."

"S. A. F." states further, "I cannot help but feel that 'Wash' must have something up his sleeve that he hasn't told us about yet."

In answer to this, I would ask "S. A. F." and "Tom" and also "Contributor 19," why they insist they are puzzled, and at the same time ignore the most vital part of the controversy?

Why not make the test and if the slack is taken up immediately, then please state why? What is the cause, and what happens to all the ends? I claim every other end is stretched.

If any reader is unable to explain the foregoing then he has every reason to be puzzled.

A letter received some time ago from the head of a firm building fly frames said in part, "In your letter you say that the cones merely govern the winding of the bobbin. We think you are dead right in that statement, although it is at variance with what is advised by some roving frame makers. We think it follows that, whether the cones drive or are driven, they really are governors. It may be true enough that if the cones are obliged to drive, there is more work for

them or the cone belt to accomplish than as if the mechanism were such as to assist the cone belt, but, even in that case, they are essentially governors.

"With the Houldsworth compound the bobbin and the spindle revolve at the same speed without the additional compounded speed or additional impetus caused from the cone. Any compound which embodies this feature of having the spindle and the bobbin revolve together is a more simple proposition as regards the cones than a compound wherein there is a differential or a difference in speed between the spindle and the bobbin. This is for the reason that in consequence of that difference in speed, the cones must be of a different form.

"The cones may be figured out theoretically correct with the bobbin and the spindle traveling together, aside from the motion of the sun wheel. Perhaps rather than to say theoretically correct, one should say before the additional factors of slippage, or difference in tension between the empty and full bobbin due to the slight variation in the pressure of the paddle and the difference in diameter as the bobbin builds up, the other factors are considered and a pair of cones can be figured out correctly by mathematical methods. After these mathematically correct cones have been arrived at, several other factors including the foregoing, have to be reckoned with and the form of the cones modified. Each of these factors in part, can be arrived at mathematically, but some, such as the amount of compression in the building up of the bobbin, must at least have been checked up, in addition to a mathematical computation. Therefore, the cones have to be modified to get a uniform tension from empty to full bobbin.

"Our belief is that these additional factors sufficiently complicate the making of the correct form of cones without the added complication of difference in speed between the spindle and the bobbin.

"Still another way of looking at it is that, with cones correct when the bobbin and the spindle travel together, must first be added the modification to take care of the difference due to the difference in speed between the spindle and bobbin and then we have the foundation cones on which to build or modify the form to take care of these other factors. This foundation cannot be as simple, and therefore as sure, as the foundation of a pair of cones mathematically correct and easily arrived at with the spindle and bobbin traveling together.

"It follows, then, that any compound such as the new so-called differential motions cannot give as good a tension as a compound of the Houldsworth principle. It also follows that variation in speed between one frame and another will require a different cone and that different cottons and different hanks to give a perfect tension will require different cones. By having a cone for different ranges of hanks and the frame run at precisely the same speed at which the cones were figured out and for which the flyers are built, a practically perfect tension is accomplished.

"Another factor in this complicated problem is that the pressure of the paddles on the bobbin is nearly sufficient to keep the spindles up to speed after the frame, as a whole, has been put up to speed, even though at that minute the train of gears driving the spindles from the jack shaft were disengaged.

"It seemed to us that this would be true; we tried it and demonstrated it to be so.

"Therefore, after the frame is up to speed, the train of gears from the jack shaft to the spindle drivers is a governing train. In a similar manner, the cones are a part of a governing train."

The foregoing letter will make good dope for the readers of the Practical Discussion Department, and proves that there is more to a fly frame than the majority of mill men admit, and please be reminded that what I claim in my mill experience was accomplished with the new differential motion.

Now, I would like to have "S. A. F." and "Tom (Mass.)" define two parts of this letter as follows:

"It follows then that any compound such as the new so-called differential motions cannot give as good a tension as a compound of the Houldsworth principle."

And "Our belief is that these additional factors sufficiently complicate the making of the correct form of cones without the added complication of difference in speed between the spindle and the bobbin."

These are facts, and it takes an expert to get the best results from any fly frame equipped with the new differential motion.

As a matter of fact, the strand of roving on any fly frame occupies less space at the beginning than it does at the finish of a bobbin. This increase in very gradual, but constant and is caused by the pressure of the presser condensing the strand. To keep the surface speed of the front roll and bobbin equal from the beginning to the end of the set is an art. The fly frame is the most imperfect machine in a cotton mill, because: First, you are unable to attain the figured twist; second, you are unable to attain the figured draft; and third, a change of hank, cottons, flyer, speeds, etc., require different cones for a precisely perfect tension.

In reference to the first defect, the only remedy is to round all presser fingers so the termination of the presser pad only will rest on the surface of the bobbin. This aids in holding the twist in the strand.

In regard to the second defect, the only remedy is to have an even strand, as even as possible, which is accomplished by a very light sliver. Next, by keeping the surface speed of the front roll and bobbin equal. The latter is the more difficult.

As regards the third, we are helpless.

In closing, I wish to state that I like "S. A. F.'s" picking hang-up. However, he should look out for holes in his sheet of lap.

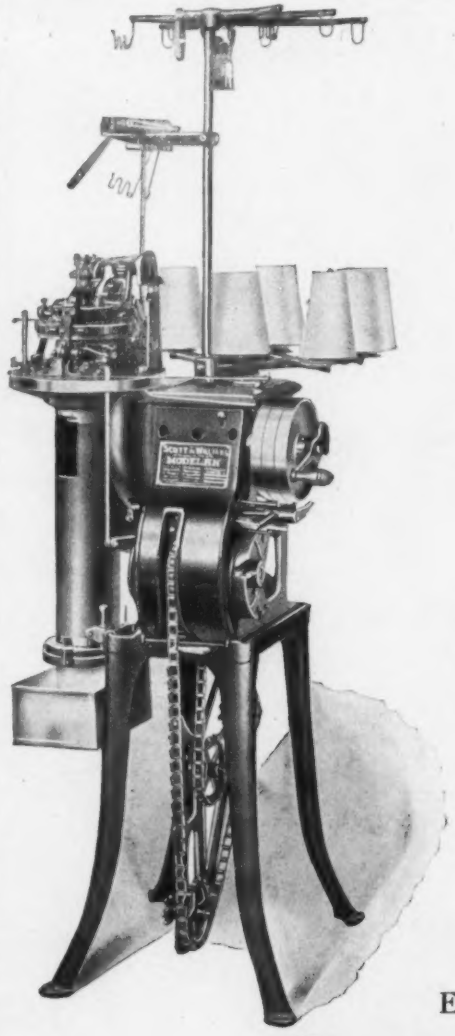
Wash (Conn.)

J. E. Sirrine & Co., engineers, Greenville, S. C., have issued Bulletin No. 2 on standardized textile mill lighting. This was prepared by George Wrigley of the Sirrine organization, and gives a description of the lighting system recently completed at the Easley (S. C.) Cotton Mills.

No one enters business to fail but the majority who do lose out do so from various causes, but principally because they disregard the question of costs. Your worst competition is largely from those who do not know what it costs to produce and do business.

BROWN MAHON, vice-president and assistant treasurer of the Judson Mills, Greenville, S. C., was recently elected secretary of the Greenville Chamber of Commerce.

KNITTING SECTION



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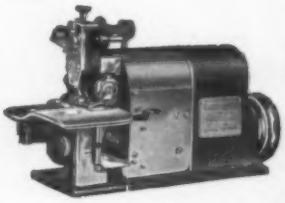

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1 6 Laurel St.,Hartford, Conn., U. S. A.

Annual Convention of Knit Goods Men

The 17th annual convention of the National Association of Hosiery and Underwear Manufacturers was held at the Commercial Museum, Philadelphia, on May 3, 4 and 5. The attendance was not as large as normal owing to a variety of conditions and the weather man did his utmost to dampen the spirits of those who did attend, staging an almost continuous rain accompanied by a cold wind.

The First Session.

President S. D. Bausher called the first session to order at 11 o'clock on Tuesday morning and introduced Dr. Griscom, who pronounced the invocation. He was followed by Edward James Cattell, who welcomed the membership to Philadelphia in his own inimitable manner. He also pointed out that the country today is in far better condition than it was at several other periods in its history and that the situation called for optimistic support as never before. Continuing, Mr. Cattell said:

You are here in convention to study and plan in connection with a great trade. It is a part of that large body of work that every American has to perform without a direct return in dollars and cents; but every time I go to a convention I think of a little thing that happened to me in Iowa a good many years ago. I was driving a car across a field and I saw a little Irish boy digging potatoes, and I asked him, "What do you get, my son, for digging those potatoes?" He replied, "I don't get anything for digging them, but I get hell if I don't." We are up against a proposition where we have all been doing a lot of work, not because we made any money out of it, but because we would have lost a great deal more money if we hadn't done it.

I have five and fifty years of clear cut memory; I went through the panic of 1869 and the panic of 1873 alongside of Jay Cooke, with whom I was associated in business, and these old eyes of mine have seen the wealth of America grow from seven billion to three hundred billion dollars. I have seen the homes in this one city grow from 52,000 to 390,000. Do you blame a man for doubting predictions who has passed through these experiences, who has read probably a hundred obituary notices describing why the United States of America died, and then sent flowers to the funerals of the men who wrote those obituaries?

Away back in 1869 they said the end had come. We had closed the war and had a debt that was more than 11 per cent of our total wealth. We had a currency that was indescribably bad. I remember paying for the use of $10,000 overnight a premium of $600 and putting up as collateral Pennsylvania Railroad stock at one-half the market price to secure the loan, so there was no question of security. Nobody knew where we were. My father and uncle went on the bond of Jay Cooke, or Cooke, McCullen & Company—they failed in England but not here—for $50,000, and were given 20,000 tons of steel rails, imported from the other side, for security and we worked it out without loss. At that time even the rails of our railroads had to be brought from overseas.

Today our debt is not eight per cent of our wealth, and yet people are nervous; eight per cent now as against 11 per cent then. Today we have three hundred billion dollars of wealth; at the close of the Civil War, at the most exaggerated estimate, we did not have twenty billion—twenty billion of wealth then, today three hundred billion. At the close of the Civil War, our currency was distrusted by everybody. I remember when Senator Fessenden, Secretary of the Treasury, tried to put on the market a 7.3 per cent loan and nobody would buy the bonds. We had no credit, and gold was up to nearly 300 per cent, while the people of the South were going back to their desolated homes with nothing but hope and the American spirit that can never be conquered. Look at what the South is today, the economic hope, I believe, of the nation, with its great undeveloped resources. Look at what the North has become and the East and the West. We have no North, no South, no East, no West now.

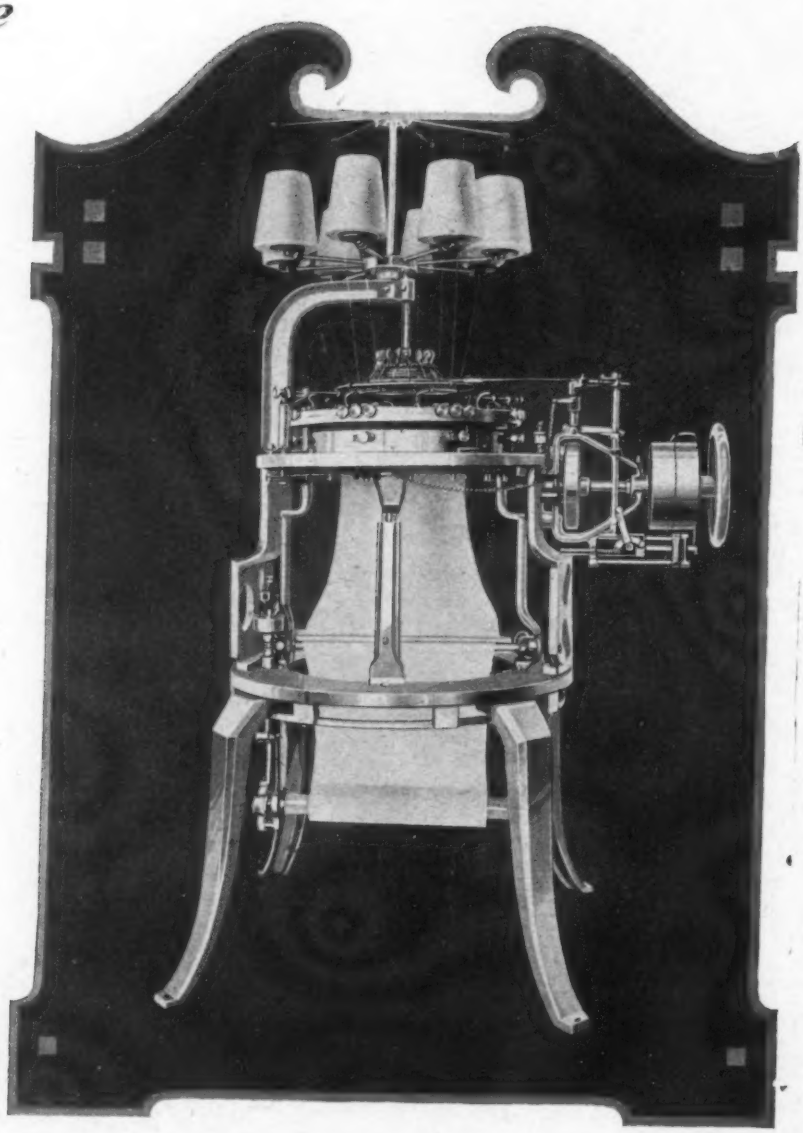
At the beginning of the war 174,000 people owned the securities of the Government; today over seventeen million people are partners in our Government. Today we practically hold the control of the shipping of the world in our hands; I lived abroad for ten years, and during all that time never saw but one American flag on an American ship. Today Europe owes us fifteen billion dollars; before the war we owed Europe five billion dollars.

PRESIDENT S. D. BAUSHER.

There is nothing basically wrong with this country; we have had no great loss of wealth; we have had no long and destructive strikes. I remember a strike we had here in Philadelphia when 135,000 men were out and the total loss of property was less than $60,000. Why? Because 175,000 of our people own their homes, and people don't destroy their own property. There is no danger of trouble in America today because seventeen million people are partners in this Government; 99 per cent of our labor is bomb-proof against Bolshevism; they may do things sometimes that are very foolish, but they always come back to sanity, and come back very much faster than anybody expects.

Someone said to me the other day, "Lightning never strikes twice in the same place because the place ain't there to be struck." We have got over this period of liquidation

Wildman Spring Needle Body Machine



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FULL AUTOMATIC

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SIMPLICITY — SPEED — PRODUCTION — QUALITY

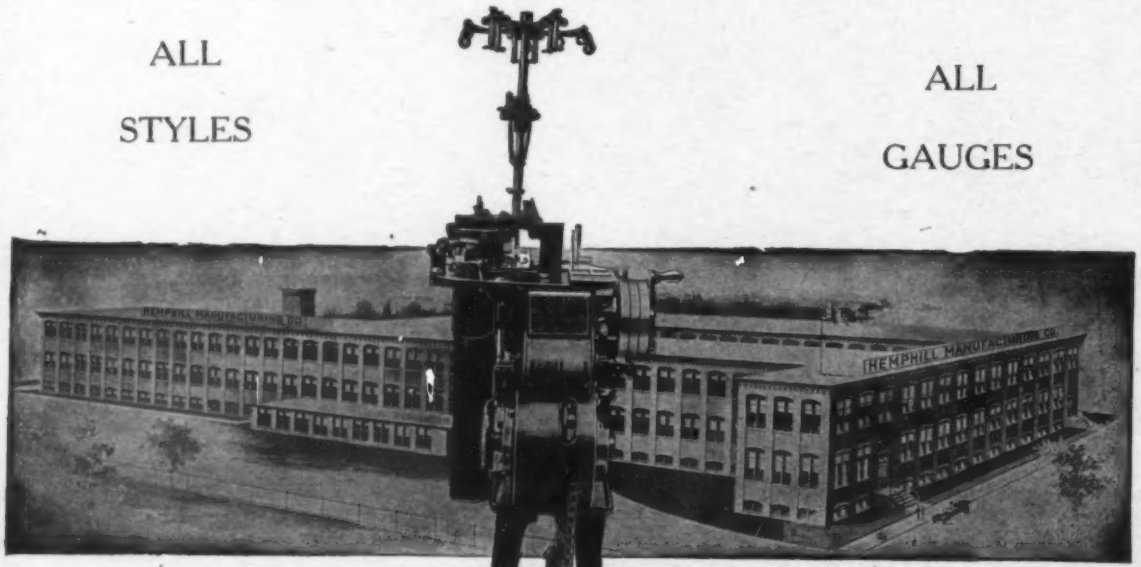
Four important things to consider when buying Hosiery Machinery.

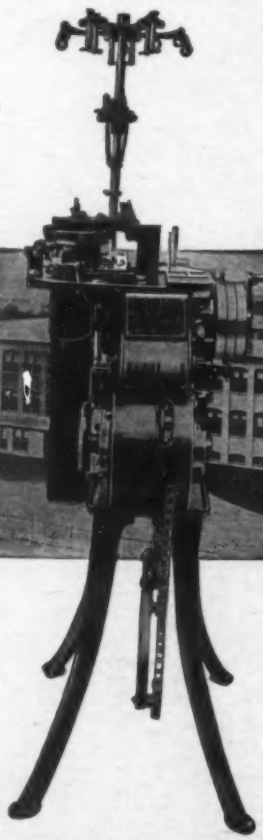
ALL PARTS ACCESSIBLE FROM FRONT OF MACHINE

Write for descriptive catalog

ALL STYLES

ALL GAUGES





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KALI MANUFACTURING CO. MERROW MACHINE CO. FLEXIBLE STEEL LACING CO.

and are coming back to sanity, and the rapidity with which we will take the up-grade will startle people, because there are more fool figurers loose in the United States than were ever to be found before in the history of the country. I sat the other day in Newark and heard a man describe how over three hundred billions of wealth had been wiped out by the war. It is utter rot. America is not one penny poorer for the war than if no war had happened. Take the extra production in America during the war period under the war impulses; I saw land in northern Pennsylvania which had not been under cultivation for seventy years carrying splendid crops during the war; I saw trainload after trainload of scrap that had been lying in fields thirty or forty years and never would have been recovered but for the high prices paid during the war. I saw men working during the war who had never worked before in their lives, producing something. We produced over twelve billion dollars of spending power that we would not have produced in normal times and we saved during the war by wearing old clothes and doing things for ourselves that we had formerly hired somebody to do for us.

Twenty-four billion dollars will represent the net cost of the war to us, and we produced a spending or wasting power under the stress of war equal to that expenditure. People will talk about the expense of the army being so many million dollars for uniforms; but remember that we did without our private suit of clothes and each man who refrained from buying a suit of clothes saved enough for a uniform; they will charge up the cost of uniforms worn by the soldiers, but will not credit the goods we did not buy for the people. It is the same way with everything; if you waste a hundred thousand dollars worth of powder in pyrotechnics, it is just the same, economically, as wasting it in battle. We cut off those wastes at home and spent them in war, and we found our soul in doing it.

Let us get rid of this horrible idea that we are bankrupt. You go into the figures of our savings funds; go into every evidence of wealth and every once and awhile you will get a wonderful surprise. Savings accounts increased a million and a half dollars in this city, and they have been increasing in other cities too. Where did it come from? Why did they increase? Because we are producing more, much more, than we wasted in war. Do you realize that over two billion dollars of money, if there had not been a war, would have been spent by American citizens abroad and lost to this country? Nobody ever mentions that. Nobody ever mentions the billion and a half of money we would have paid to fire insurance companies on the ordinary traffic controlled by the Government and protected at the expense of the Navy; the Navy is never credited for that.

Let us look the facts in the face; let us recognize that although ten million men have been wiped out in Europe that after we do without standing armies, we will remove from the burdens of the worker the feeding and clothing of those ten million people who would have been in standing armies and never would have contributed anything to the wealth of the world before the war because they were held in idleness. Let us look at the credits as well as the debits, then we will get our second wind and our courage.

A lot of our old illusions are being dissipated. One of our boys was over in Paris on a French holiday and all the pretty girls were kissing the soldiers. He had never had any experience like that, and after the twenty-second French girl had kissed him he turned to a friend and said, "Sherman was a liar, war is not hell." We had an illustration of real democracy when the regiments broke up at Camp Dix. One fellow said, "I know what is the first thing I am going to do when we break up, I am going to smash the second lieutenant in the jaw," and another fellow said, "No you won't, you have got to stand in line and take your turn." That was the feeling all over the camp, but the next day they were all drinking together officers and men, and everybody had forgotten their grievances.

We want to emulate the dear little chap at Camp Meade. He was going down the road and the sentry called, "Halt, where are you going?" "I am going to see my sweetheart down the pike." "You can't go; my orders are to shoot to kill if you cross that line." He went back and thought of the matter a while, and then he returned and said to the sentry. "I have made up my mind; I have got a dear old mother in heaven, a wicked father in the other place and a sweetheart down the pike, and I'm going to see one of them in the next ten seconds;" then he started down the pike. That is the spirit of America today. Let us put aside all our foolish fears and come back to the old

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Knit Goods Manufacturers

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Do you know that cotton knit goods finished by the ZETTO process alters cotton knit cloth so greatly that it can be used for purposes other than for which it was originally designed?

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Samples Finished Free of Charge. *Correspondence Invited.*

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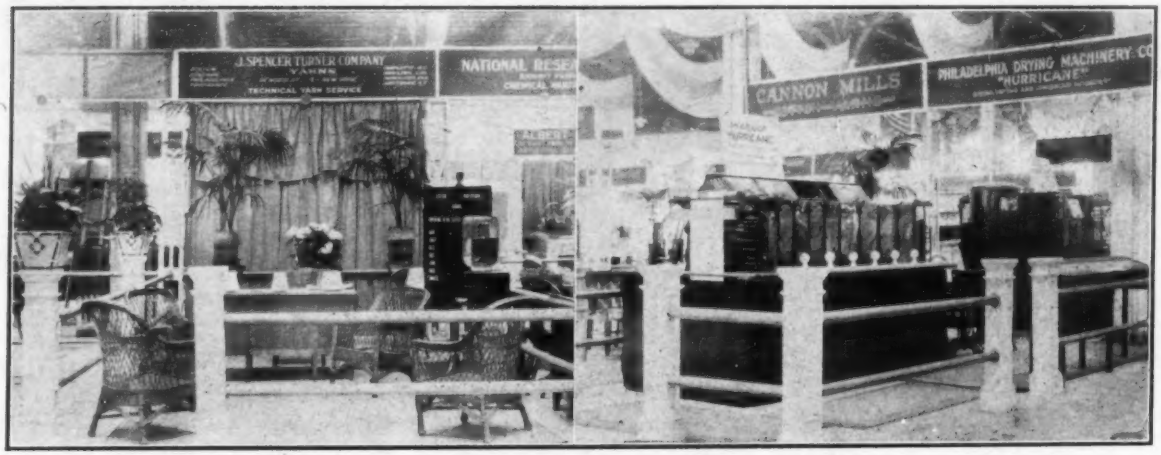


J. SPENCER TURNER CO. PHILADELPHIA DRYING MACHINERY CO.

thought I expressed, I think, at one of our conventions—there are so many things in life that are constructive rather than destructive; in their outward seeming they are destructive but that very thing is an evidence of their constructiveness. You plant a seed in the ground and the first thing it does is to turn black and rot and you think death has ensued, but it is only the beginning of a new life. I planted a grain of corn out in the suburbs of Philadelphia and from that single grain got eleven hundred back, yet when it was first planted that seed looked as if it had died.

That lesson of how the destructive conceals the constructive was brought home to me about a hundred years ago when I was a little child. I woke up one night and heard an awful noise in the back yard. I looked out of the window and saw about forty cats fighting. I was terribly scared and called my father and said, "Dad please stop those cats from fighting, in the morning they will all be dead." My father said, "Go back to bed; all that fighting only means more cats." And so all our struggles, all our fighting, only means more business, better business and better handling of business. We are all learning the game.

I was out yatching with an old captain and his mate on the coast of Maine some time ago, and when the captain came home he took this old mate to his first Episcopalian service at a church in Portsmouth that was 250 years old. The next day I heard him talking to the captain. The captain asked him "How did you get along at the Episcopalian service?" "All right, I riz and fell with them and come out damn near even." That is the trouble about too many people; they come "damn near" instead of toeing the mark. As a patriotic principle we have got to play the game and play it right; we have got to play ball, and playing ball means hitting the ball, not hitting the umpire; there's a big difference.

We have had too much reckless writing by certain young men educated beyond their intelligence. I picked up one of the New York newspapers during the war and it had in great big headlines "Forty-two million dollars appropriated by Congress yesterday; this means national bankruptcy." Why didn't the man who wrote that say that on the same day Congress appropriated that forty-two million dollars, the nation as a whole had created a hundred million dollars? Do you realize that all our great national wealth is only equal to six years of wealth production? Only six years! Do you realize what it means, that we have been spending 90 per cent of all we made or created in the same year we made it? It means that we have been extravagant, but it means also something more, it means that without any feeling of poverty, without any pinch of economy, this nation can save twenty billion dollars a year and not feel it. We have been spending over forty.

Now, Europe cannot do that; they cannot do it because they are living too close to the bone; but we can do it. Ten cents a day from fifty million of our people is all that would be required—that is, less than half the people is all that would be required to pay the national debt, principal and interest, in twenty-eight years. Ten cents a day would mean five million dollars a day and that would provide a sufficient sinking fund to pay our national debt, principal and interest, in twenty-eight years; and yet we are all trembling in our shoes at that ten cents a day from every other man, woman and child in the country. The thing is so pitiful, so shameful, that it seems as if we had lost our courage. We take over a hundred million dollars out of the ground in this country every second that the clock ticks. Let us face the future without fear and with a manly heart.

During the dark days after the assassination of Garfield, I remember being at a meeting in Wall Street where a lot of doleful talk came out. I was standing near the edge of the platform and an old colored woman came up and said to a friend of mine, "When did God die?" We passed that word all over the platform and more than one man was ashamed of himself, ashamed to think that he had forgotten the faith of the fathers and ashamed of himself that he had lost his faith in God which made each of us a sovereign by divine right.

My friends, I have written about seventy-five separate organized governments and have put twenty-five years in travel, so I have got a right to speak with some authority; I have not the least fear for the future. I have a greater faith in our form of government at this moment than ever before in my life. When you think of 110 million people bowing down as they will to the decision rendered yesterday by nine men, wiping out a law passed by the elected representatives of 110 million people, and the law lifts its hand and they bow at its bidding, as they will do in the case of this election decision and all other decisions of our Supreme Court—we never differed with the Supreme Court but once, and that was in the Dred Scot decision, and we paid

A. KLIPSTEIN & CO. SIGNODE SYSTEM.

in blood and pain and tears, three billion dollars in money and two million lives for that.

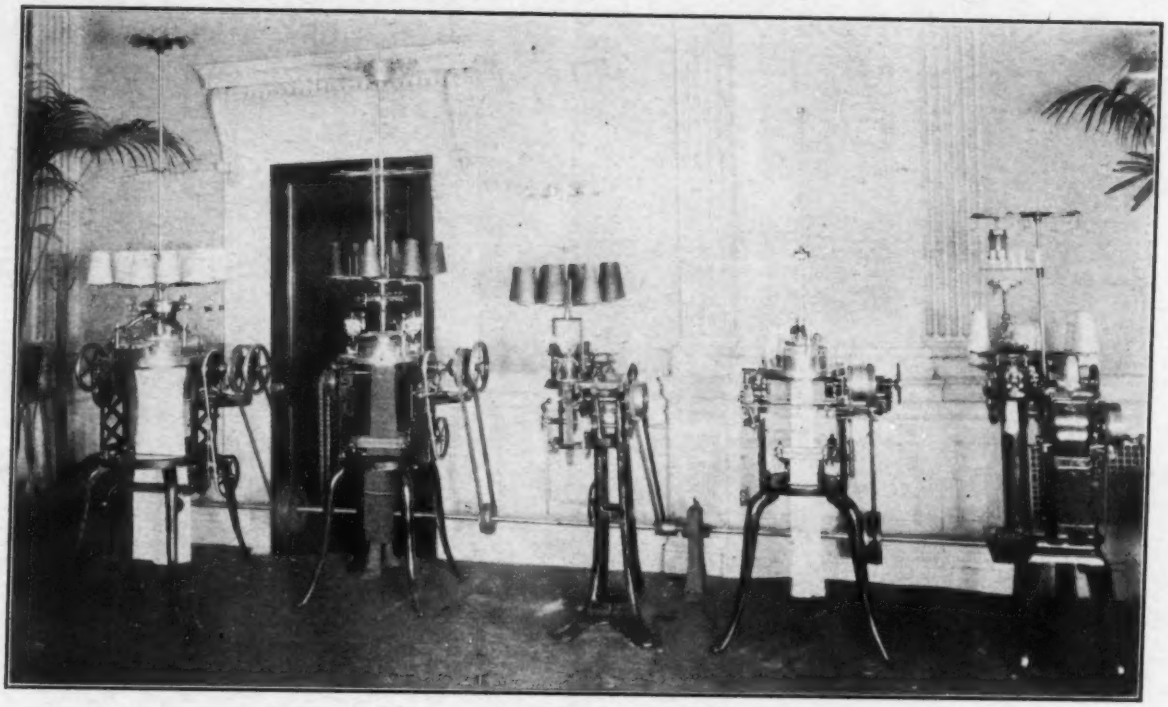
This is a government of liberty under the law; it is not a republic, it is not a democracy, but it is a contractual relation established by men who wanted to facilitate business, by men who found that other men must obey the law and play straight or nothing could develop, by men every one of whom had something to lose, by men every one of whom knew that the pure democracies of the past, in a moment of passion had undone in a day what it took years to produce, and so they put into that constitution certain privileges and rights which are not found in a pure democracy and which we do not use except under certain conditions. We have got a business document that holds us together while other nations have gone to pieces, and it will continue to hold us together until it makes us the hope of the world.

Go back to your several vocations and even your avocations steady of purpose, strong of ambition, stout of heart, with faith in yourself and your fellowman. If our government means anything, when we are doing that which lifts humanity and mitigates conditions around the world, we are invincible and invulnerable because we have behind us the power of the living God. I have not the slightest fear of the future; God gives us all strength to find the larger visions and the wider hopes. I was sitting in my little office facing that great court in the City Hall yesterday evening when I got tired. In the years I have been there, and I have averaged over sixteen hours a day for the last twenty-two years,—I traveled 5,000 miles last month and 4,000 miles the month before—when I am tired and breaking a little, I look up to that south tower of the City Hall at the old flag that always flies there night and day, the emblem of our patriotism—it doesn't go down with the sun—and yesterday I was looking out there and feeling tired, thinking of this meeting—I know the burdens you men have been carrying and my heart has been with you—the old flag was wrapped around the pole, nothing could take it away, I could scarcely see it, it took my imagination to find it; the air was still, the clouds were dark; I have on my desk two others of that great trinity, a copy of an old Bible my mother gave me in 1868 and a photograph of that Liberty Bell that carries on its lips words from the same Book, and that old flag. I looked at the two members of that trinity and then lifted my eyes once more to that old flag, and somewhere out of the heavens had come a breath of air; the old folds had unwrapped, and there they were snapping in the breeze, silhouetted against God's eternal blue. I could not move them, human hands could not change them, but out of the heavens there had come a breath of air as if in answer to my prayer, that opened Old Glory and I had got my message of a new hope, not through anything I had done, but through that which had come from Him who holds everybody and everything in the hollow of His hand. Play the game straight; play the game strong and this poor old world, dizzy with blood and pain and tears will not have called upon America in vain for help, for new courage, for a new lease of life.

The Open Shop.

The next speaker on the program was Walter Gordon Merritt who spoke on the open shop. In his address Mr. Merritt pointed out that monopoly feature of organized labor. He declared that the unions demand that all employees of all industries should be members of their respective trade unions and that all industry should function only through those unions so far as labor questions are concerned. This plan, he declared, involves a fundamental conflict with the political faith and ideals of America, because it involves lockstep and servitude, and does not keep open the doors of opportunity to all classes of qualified workers. Further, the closed shop program involves not only monopoly, but monopoly by compulsion, and the union reserves the right to engage in strikes and boycotts, etc., regardless of injury to public or private rights, in order to prevent the employment of any non-union man. Therefore, declared Mr. Merrit, the issue before the country is not of a partially closed shop plan or a voluntary closed shop system, but a national closed shop program maintained by compulsion which, like some colossal reaper, would mow down the rights of others and work to the country's detriment.

Industries in which the closed shop flourishes often wither, said the speaker, while the cities of the open shop leap forward with new vigor and prosperity. Just so, he continued, will closed shop nations fall by the wayside in any commercial rivalry. He cited England, the most highly organized of all the great commercial nations, as an evidence of this. He then treated upon the closed shop as a menace to political safety, and pointed out that the closed shop system demands much of society, offering no hostages



H. BRINTON CO.

for good behavior in return. "Sovereign power," he declared, "must not be vested in any class institution. A democratic state functions for all classes of citizens and all classes of citizens are allowed to participate in its control. That alone justifies its exercise of sovereign power. Such a government is responsible to all classes of people and all classes of people are responsible to that government. Labor unions which function for one class only, and in which only one class participates, cannot be vested with the power of saying who shall and who shall not follow a trade."

President Barnett then introduced Dr. Paul H. Nystrom, who spoke on "Retail Research Work." He spoke in part as follows:

Retail Research Work.

In this period of price decline and consequent difficulty of maintaining profits, business men must re-examine every item of expense with the view to eliminate every unnecessary detail. Marketing as well as production expenses are coming in for this close survey.

The Government has recognized the need for investigation and study of the problems of marketing agricultural products. In 1913 there was established in the United States Department of Agriculture an office of Markets, later called a Bureau of Markets. The object of this bureau was to study marketing methods for agricultural products, to work out standards of grading, investigate transportation and storage as affecting farm products, and so on. Under the present administration it is more than probable that the work of this bureau will receive added importance by extension of its duties. Greater Government activity in investigations of marketing is certain to come.

Since the establishment of the United States Bureau of Markets, states have taken up similar problems with closer local application. Up to the present not less than thirty-one states have established bureaus, commissions, offices, or departments on marketing, most of which, so far, aim primarily at reducing the costs of increasing the efficiency of marketing farm products, but in a continually growing number of instances, authorized to take up and investigate the marketing of "other necessities of life."

There are in general two courses of action open to those who see the inefficiencies of the present systems of marketing. Either the present system is to be discarded or greater effectiveness introduced into its details, letting the system stand.

There are many students of our marketing system who seem to think that the only way in which gains can be made is through revolutionary change, away from the traditional channels of marketing through middlemen—that is from producers to wholesalers, factors, jobbers, brokers, commission men, or whatever other designation may be given to them, who in turn sell to retailers, and from the retailers to the public. Some think that the way to more economical distribution is through such newer classes of distributors as department stores, chain stores, or mail order houses. Others think that a change in ownership from private to public or co-operative ownership will bring the desired results.

A look back at the history of marketing will help somewhat in evaluating these respective proposals of reform. It will be found that each of the types of marketing in existence today came into use in response to a definite need, and gradually changed from age to age as needs changed. To illustrate, early division of labor in production forced the establishment of middle men where before producers had dealt directly with consumers. Producers widely scattered made necessary a marketing system which included local buyers to take the goods produced off the hands of the producers; wholesalers, who took the offerings of the local buyers, and who in turn sold to retailers. Large scale production brought on by the industrial revolution in the

H. A. FLORSHEIM. MONROE CALCULATING MACHINE CO. PROCTOR & SCHWARTZ, INC.

latter part of the eighteenth and early nineteenth centuries utilized this system. In fact, large scale production would have been impossible without a distribution system such as this. Without this system of distribution all of the economies that have developed in production during the last hundred years would probably have gone for nothing. This is the system that is under operation today.

There is another method of attacking the problem of the high costs of distribution, one that is not spectacular, nor revolutionary, nor necessarily drastic, but which has already given promise of results proportionate to efforts to be applied. This method is merely to apply scientific methods to the improvement of the present systems of distribution, step by step, detail by detail.

The first step in a scientific approach to reducing costs of distribution is to determine by survey, investigation and actual measurement what the present difficulties are and what stands in the way of improvement. Although considerable work has already been done in this direction, much more must be undertaken, but it is possible even at present to indicate roughly some of the details in the distribution system which may be profitably studied.

Poor roads greatly increase the cost of bringing the farmers' crops and produce to market, costs that must be added to the price that consumers eventually pay. Inadequate railway transportation is another element that makes a considerable addition to the costs. Car shortage at crop moving time, cars unsuited to the products to be hauled, excessive delays in forwarding, at terminals, on the way, and at transfer points, are common sources of expense. Every day added to the time required for transportation adds not only to the transportation charges, but also directly to the cost of the goods themselves in interest charges on the capital invested in the goods, and in an additional burden of other overhead expense due to lengthening the period of turnover. Delay in transportation as a factor of expense in distribution has not been given the attention that it deserves. Poor location of terminals makes a great deal of expensive cartage necessary. Congestion of traffic in city thoroughfares is a growing cause of increased costs in distributing goods. Inadequate, inefficient, poorly located storage facilities cause huge losses. Inadequate, unauthoritative and inaccurate collection and dissemination of market information such as needed by producers, distributors, and consumers is responsible for great wastes. Through lack of such information business in many lines now passes constantly from glut to famine and back again. Poor packing of merchandise, inefficient marking, rough handling, uneconomical methods of handling are causes of waste and therefore of higher costs of distribution.

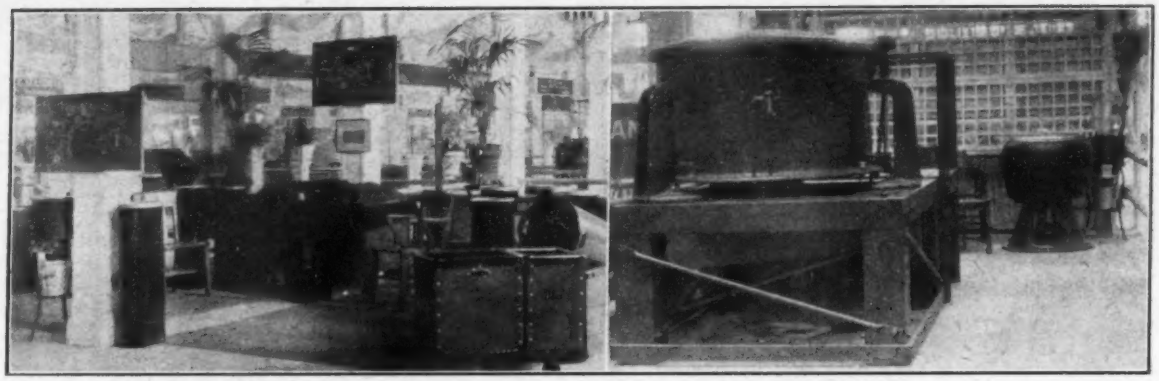
Coming more specifically to the activities of marketing through wholesalers and retailers, there is a startling loss of the wholesale salesmen's time, in finding customers, in making appointments, in fruitless interviews. The time of both salesmen and buyers is lost. Probably less than a sixth of a salesman's time, averaging salesmen of all classes, is actually employed in selling or even in displaying and describing merchandise. Anything that can be done to improve this deplorable economic condition will increase efficiency and decrease costs.

No one can ever begin to estimate the losses resulting from poorly trained salespeople, who fail to sell and who waste the time of their prospective purchasers through lack of knowledge of their goods, their customer's wants, and their business, or through lack of ability to use their knowledge properly. Another source of loss that adds to the high level of sales expense is that the rank and file of salespeople of most classes, but more particularly in retail stores, lack interest in their work. The fundamental incentives of profit in proportion to effort expended and of self expression in management, such as the owners or managers feel, is for the most part totally lacking. For this reason most employees give but a fraction of their ability to their work.

Advertising is or should be an invaluable aid to marketing. In the list of expenses of distribution it occupies a prominent place. There is certainly room for improvement in its administration.

Duplication in delivery organizations by retail stores is a source of economic waste. A beginning has been made toward eliminating some of this waste through co-operative delivery and by utilization of the parcels post. In a few cities a good share of all retail deliveries are now being made through the post office with a considerable saving in money and no reduction in efficiency.

Poor buying, imperfect realization of public demand, duplication of stocks of goods in too many styles, brands, and makes, tying up too much capital, slowing up turnover, and increasing overhead expense are causes of high costs



DIAMOND STATE FIBER CO. FLETCHER WORKS.

of distribution chargeable to buyers of goods, both in wholesale and retail stores.

There are many who think that there are too many retail stores. Would goods be sold for less if there were fewer? Probably not, because a large part of the competitive losses now occurring because of the number are borne by the dealers themselves in unpaid services. It may be argued that if their number are reduced the rentals for the locations that would be eliminated could be saved. This cannot be definitely checked by such experience as has been recorded in any public way. Concentration of retailing seems invariably to result in increasing rents. In fact rents tend to increase faster than sales, so that the fewer the stores the higher the share of the landlord. More studies are needed to determine the exact effects of restriction of the number of stores on costs of distribution.

There is another matter that needs consideration in connection with any attempt to reduce rents, and that is the fact that the store plant is unused for a large part of the time. It seems impossible to secure the high degree of use that may be had in a factory or shop where, when there is plenty of work to be done, the plant can be kept working both night and day by means of two or three labor shifts. Store hours are by custom and legislation steadily growing shorter. This means that the capital invested in stock and plant has fewer hours in which to produce.

Finally, there is undoubtedly an enormous loss due to unfairness and dishonesty, a loss that is now carried in large part, if not wholly as an expense of distribution, that must be added to the price paid by the consumer. Failure to return containers lent by distributors seems a small item, but in such a business as milk distribution in large cities the loss to milk distributors due to non-return of empty bottles is enormous.

Uncollectable debts and the cost of collecting delayed payments are important items in the expenses of distribution.

Disregard of contracts in such matters as refusal of goods after placing orders, failure to deliver goods after orders are placed, abuse of the privilege to return goods, claims for readjustment, and many other similar items make up large losses in money, time, labor, and thought that should be made available for the public good.

Unfair competition, efforts made, not to increase legitimate business, but to impede or even to destroy competitors; commercial bribery, "graft" and the exercise of monopoly, all burden distribution expense far too much.

A source of considerable loss is theft by employees, burglars and shop-lifters. Some retail establishments count upon a fixed percentage on their sales representing losses due to this cause, a percentage that is added to the gross expenses which form part of the selling prices. Many of the losses of the distributive business, including theft, breakage, fire and so on are covered by insurance. In this way, the individual distributor saves himself against exceptional loss, but the cost of the insurance is carried as an expense against the distributing process. Hence the public must pay a price for its goods that will cover these losses. Anything that can be done to reduce them will by that much reduce the expenses of distribution and the prices of goods.

The leaks and wastes enumerated are certainly responsible for at least a quarter of the present costs of marketing. They may be responsible for a third or even more. Here, then, is a great field for reducing costs by improving present methods. The first general step toward such improvement is education. Trained minds are the means through which the improvements may be devised, and trained workers are needed to carry the improvements into effect. A beginning has been made. Educational service to salespeople and other workers is now commonly found in the better classes of both wholesale and retail stores.

A beginning has been made also in education in distribution and marketing in American colleges and public schools. Several colleges offer courses in marketing, selling, sales management, and advertising. Many high schools give similar but somewhat more elementary courses. The main drawback to a rapid development of public education in marketing seems to be a shortage of teachers who can conduct courses, rather than lack of public interest. Considerable aid is being given to distribution through educational short courses, institutes, and conventions and extension classes conducted by some of the state universities on systems much like those adopted by their agricultural colleges in conducting educational work for farmers. Associations of dealers have given to their annual meetings more and more of the spirit of educational gatherings.

The important thing to note is that the successful marketing of goods is to be dependent not only upon personal abilities, but also upon definite knowledge of merchandise markets and marketing methods. This being the case there is hope for progress in the direction of cutting the costs of marketing and making our distribution system more effective than education. The movement to gather facts about marketing is under way and will grow. Eventually it will

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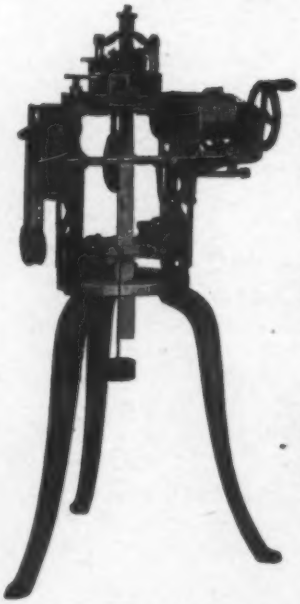

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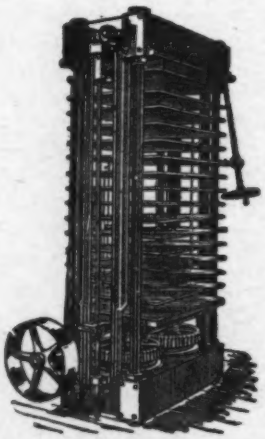

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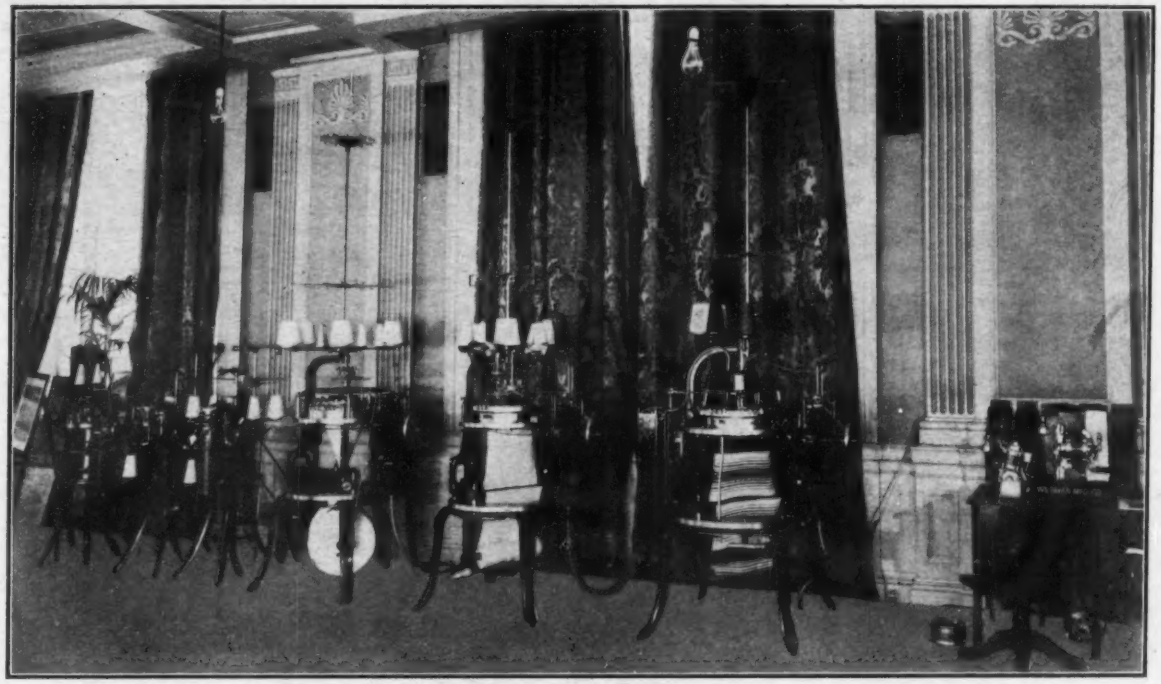

WILDMAN MFG. CO.

bear a fruit in this field, just as similar movements have done in practically every other field of human endeavor. That there is room for improvement is admitted by all. The only reason for existence that any business can offer is that it is conducted efficiently and that it performs a service that people want. No concern or industry has a right to ask for any public protection in its business until it has set its own affairs in order. As long as there is a possibility of eliminating wasteful practices there is an obligation to attack such practices in whatever way may be necessary to eliminate them.

The reading of the president's report concluded the session.

The Second Session.

The final session of the convention was held on Thursday morning at 11 o'clock with President Bausher presiding. As the first speaker of the morning he introduced Frank H. Burgher, who addressed the delegates on the subject of "Trade Associations." An abstract from his remarks follows:

"Trade Associations."

Business today must be conducted on the basis of facts rather than on opinion. In framing governmental policies regarding business the demand is more and more made for facts. Facts are the governing factor in the relation between industry as a whole and the general public, between the business man and his bank, between the business man and the legislative branch of our government, between the business man and the executive branch of our government, between the business man and the judiciary. The demand is for facts on which to base human relations, in the terms of the Declaration of Independence, with a decent regard for the rights of mankind.

A legal authority in trade association organizations has recently summed up the following list of the various activities which so far have developed which can best be carried on by concerted trade action.

(1) Collective representation concerning legislation which affects the industry as a whole.

(2) Collective action regarding traffic matters.

(3) Collective utilization of patents.

(5) Collective standardization cost accounting and standardization of types.

(6) Collective advertising.

(7) Furnishing statistical facts to governmental agencies, trade magazines and statistical bureaus and agencies.

(8) Exchange of accurate knowledge which leads straight to scientific research work collectively.

(9) Study of trade practices and unfair methods of competition.

(10) Dissemination of full and accurate trade statistics, as to things done.

(11) General information as to the course of the market and details of supply and demand.

(12) Credit information.

(13) Collective information of production possibilities for War Department in emergency use.

These are not alone cold statistical facts, but are filled with human interest.

The education of the ultimate consumer in the mysteries of price movements was suggested by a well-known economist at a recent trade conference of retailers in the following terms:

"Your problem, as I see it, is to convince your customers first that your prices represent the market value of your goods, and second, that you are not making an immoderate profit.

"Knowing that most of your customers are women, I cannot answer for them. But speaking as a mere man, I

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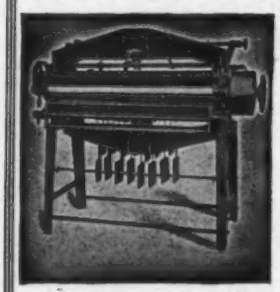

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YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.
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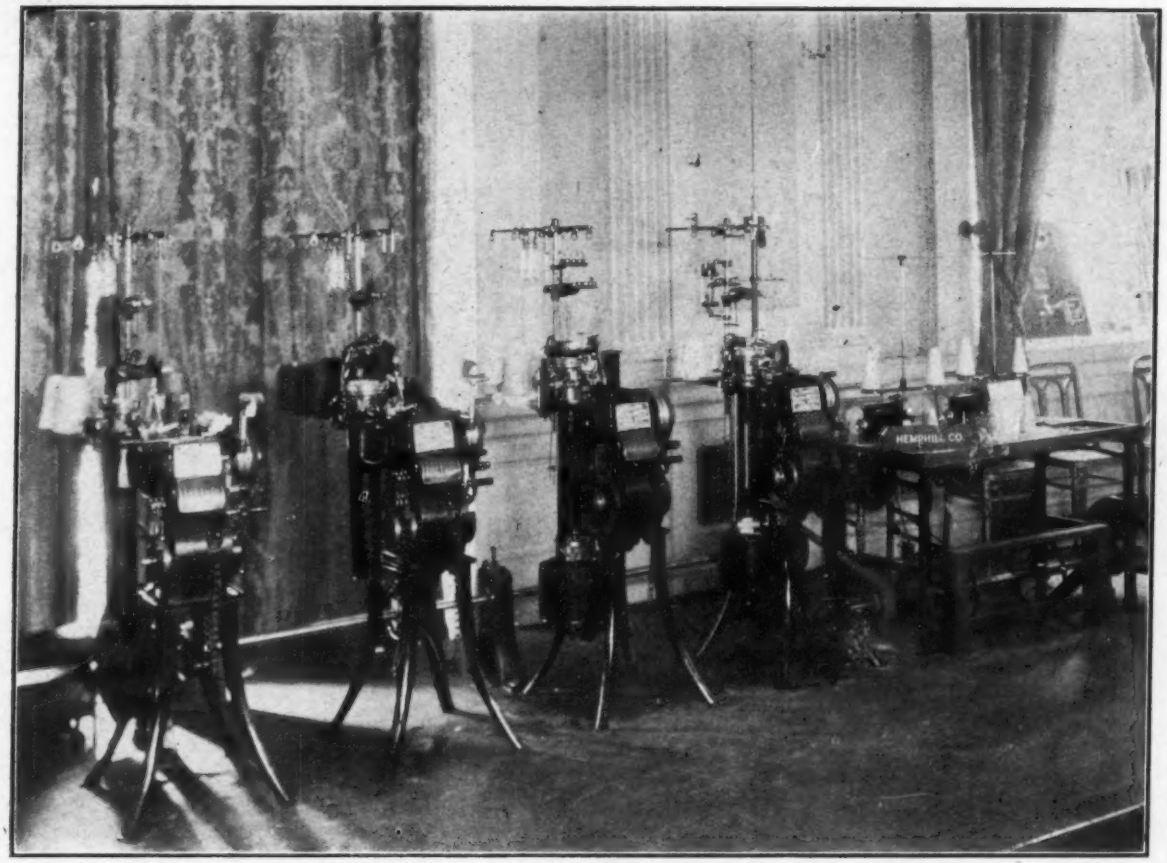


HEMPHILL CO.

may say that I would greatly prefer to deal with an establishment where fair prices made with due reference to the wholesale market were charged, than at a shop where bargains were only to be had by those who watched the newspapers closely and were willing to fight their way through crowds in order to get the things that they wanted on the day when price reductions were in force.

"I would suggest that the retail prices be checked up periodically with wholesale prices and the percentage of mark-up, including both expense and profit, be revealed to the consumer. It will be evident that my suggestion regarding the sales check contemplates a candid disclosure to both employees and your customer of the percentage of profits that you aim to make and the cost of distributing the goods in which you deal.

"The public does not understand what it costs to conduct a business today. They compare retail prices with wholesale prices, conclude that the difference is a great profit and turn away angry. I think that you owe to the public and to yourselves to make it plain that you are not overcharging."

Germany is the home of the combination in trade as far as Europe is concerned. Her process has been through kartels or contracts among independent establishments regulating the output of each establishment and in some cases the prices. It has been a systematic growth carefully thought out and, before the war, free from violence and compulsion. It has been capable of being extended from a particular industry to a whole group of industries. There was a time when the German State opposed the German Kartels. Then came the war period, and the German State not only approved the Kartel or combination but compelled the co-operation of each branch of every industry, and then formed the industry into syndicates, which operate under State control.

Super organizations, super syndication of German industry as a war measure, has come to stay. Now how can we knit underwear manufacturers graft the efficiency of the German kartel method on our tree of democracy. We have a three-fold purpose to accomplish:

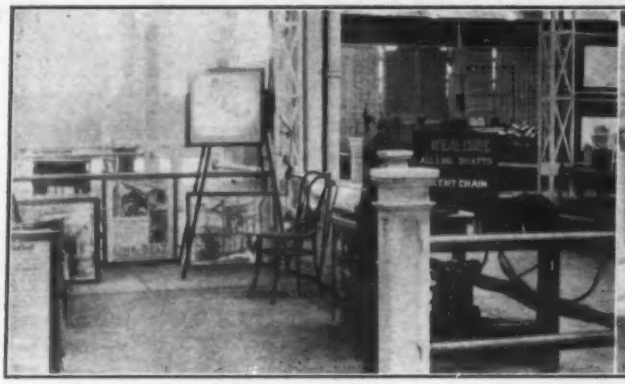
1. To make underwear.
2. To devise methods of production and distribution to meet modern requirements in a constantly changing world and keep the facts recorded for general use.
3. To preserve the integrity of our democracy.

The first purpose is a self-evident fact and requires no explanation.

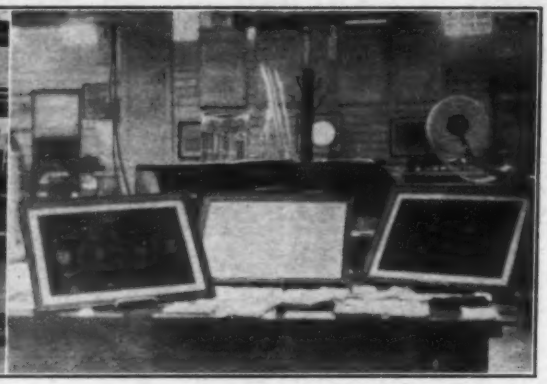
The second purpose is the reason we had for extending the work of our knit underwear association. We have endeavored to build an organization that would be a place of public record to be turned to with confidence. Our aim is to permit any one interested to turn to the records of a whole industry and find:

1. A record of prices both commercial and for government use.
2. A record of the volume of production.
3. A standardized cost system to base comparisons on.

The New York Stock Exchange, in the last analysis, is



LINK-BELT CO.



KAUMAGRAPH CO.

simply a place of record where stocks and bonds or securities of corporations are bought and sold in a way to safeguard the interests of all concerned. It has nothing to do with the making of the prices for these securities. This is done in the good old way of barter and trade. The Exchange simply records the price and quantity and tells the world by wire.

The world is puzzled as to what are the real values of commodities at the present moment. Our banking systems have published volumes of opinions. They have been able to give the world full and reassuring details of the money in circulation, just where it was and the use to which it could be put. But in the industrial textile world we have not been able to supply them instant and accurate information as to the operation of the accurate law of supply and demand in textiles. The course of the textile market since March last proves the textile trade up to that time was not based on facts, but on fancies. Those in the banking world felt it, but they could turn to no place of record and prove their fears, which were well founded. And that place of record is what some of us have tried to create in an humble way.

And we want to preserve the integrity of democracy. We want to do business in the terms of democracy, viz., with the full consent of the governed. We want to do business with a decent regard for the rights of mankind, and to do this we must have facts to tell our stockholders, our farmers, our labor, our customers, our consumer, our banker, our legislators, our judiciary, for these are all essential parts of the democracy which we are trying to perfect so that men of many minds can dwell together in unity and peace. We want to co-ordinate the operation of our industry, record the facts and perfect our democracy.

The next address was upon

The Open Price Plan.

by Roy A. Cheney, of Utica, N. Y. Mr. Cheney, who was entirely familiar with his subject, spoke in part as follows:

The open price plan in business or in industry, when operated correctly and truly as an open price plan and nothing more, means simply and solely the telling or publishing of the prices of your product to those who are interested in exchange for a knowledge of the prices of their product.

It is absolutely unquestioned that men in business or industry seek to learn as much as they can regarding their competitors' lines and prices. Some times there is an open or frank exchange over the telephone or by mail between men who have become friends, but most usually the desired information is sought and obtained in devious ways and by kitchen door methods.

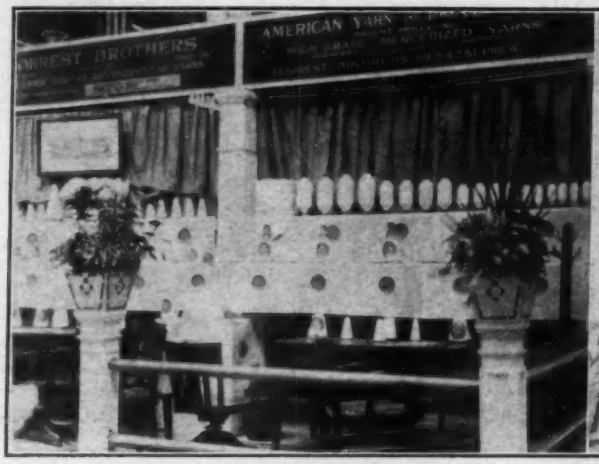
Most of the large retail stores, if not all, have employees whose sole duty is to shop in the stores of competitors for the sole purpose of getting price information. In the manufacturing end, the manufacturer buys samples of his competitors' product for comparison with his own and then through his salesmen, selling agent or by whatever means appeals to him, he seeks to learn his competitors' prices. The writer knows that in every business where the open price plan is not in operation this scramble for price information takes place.

What is the result? In the first instance the securing of information in these roundabout ways is expensive. In the second place, and the most dangerous, the information secured is often times garbled, distorted and in some cases absolutely untrue. The net result is that the seeker after information is misled to his damage, and sometimes to the damage of an entire industry. And it is an absolute truth where a business or an industry suffers unjustifiable loss through lack of information or misinformation an economic wrong has been committed.

The economic danger resulting from lack of authentic price information has been recognized by our government and in fact by enlightened governments the world over. The results of this recognition are the governmental reports on cotton and the recently instituted wireless report service in the interests of the farmer, giving daily the prices current in the main food distributing centers of the country on agricultural products. All of this is simply the open price plan on a national or governmental scale, instituted because producers composing a large minority of the people, demand this information for the proper conduct of their business and, the government recognizing the economic value of it, grants the service.

On the other hand, individual industries, feeling as acutely the need of like information but not having a large enough representation of our population to warrant governmental aid, have set about gathering this information among themselves. The result is the open price plan, first promulgated by the late Arthur J. Eddy.

The first principle of the plan to be grasped, remembered and practiced is that all prices reported through a secretarial office must be prices that have been actually made and quoted in the ordinary conduct of business. In other words, the information given must relate to past transactions



AMERICAN YARN & PROCESSING CO.

MOREHEAD MFG. CO.

actually consumated. Prophecies and hopes should not and must not be tolerated, because they are dreams and not facts.

A principal equal in importance to the one just enunciated is that a member in joining such an association must know and feel that he remains in absolute control of his business policies and that he is bound in no way, morally, legally or financially, to conform his prices or policies to the reported ones of any other member. And that he is in no way bound or obligated to maintain the prices he has reported, but that he may and, in fact, is free to change his prices as often and in whatever direction appeals to his business judgment. The only obligation that rests upon him is that he will report his prices and his changes in prices to his association office when he makes them.

What is the net result of this interchange of information to a member of an Open Price Association?

(1) He gets the information he is always seeking.

(2) He gets it quicker.

(3) He gets it at less expense than by the old devious methods, and

(4) He gets true, authentic information because it comes to him direct, and he is relieved from relying upon rumors and garbled stories as a basis for his business judgments. In other words, he is arriving at decisions in an economic, scientific and time saving way.

The gravest danger to any industrial association is the growth within it of a combination to fix and maintain prices. These combinations are so foolish and so useless that it is a wonder business men have not discarded them years ago. Besides the loss of customers, good will and the danger of legal punishment, these combinations mean the breaking up of the association which tolerates them. They may last during a rising market, but in a decline they will always end in a row. Why? Because the members of the association have come to look upon it as a price boosting and maintaining organization. In a decline the banks or his board of directors will force some manufacturer to cut his prices. He does so in spite of his promises to or agreements with the combination. The organization then ceases to function as a price fixing organization, and the members accustomed to look upon it as such get out. So why run the risk of breaking up an organization, constructive in its work and valuable to its members and the industry for the temporary gains resulting from a price fixing combination. It is as foolish as it is illegal. The honest operation of the open price plan will not result in any such combination; it will not raise or maintain prices, and the secretary who permits such a combination to grow up within his organization, open price or not, is simply paving the way for the disruption of his organization and the loss of his job.

The dangers of such combinations in our industries are very small. There are too many in the business and, as the United States Government survey on knitted underwear and hosiery aptly said, there are no combinations in these industries because any one with but little capital can buy a few machines, start a mill and become a competitor.

In the discussion that followed Mr. Cheney's address it was brought out that investigation had shown a great variation in prices on similar goods. It had also uncovered a decided interest in the subject among many manufacturers. From the number of inquiries received along cost accounting lines it would seem as if interest was also being aroused in this direction.

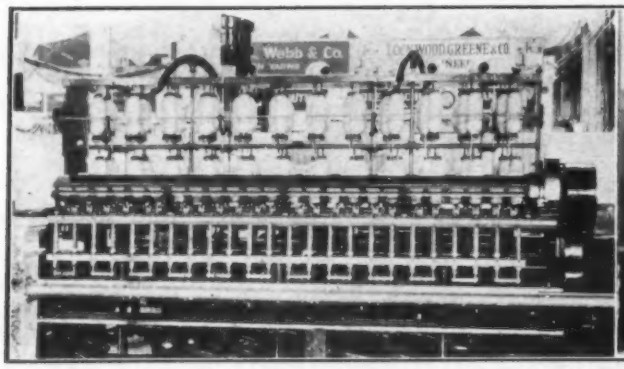
The report of the committee on resolutions was then read and resolutions adopted covering the following subjects:

That the Association approves the efforts of Chambers of Commerce, Boards of Trade and other organizations to supplant the "closed shop" with the "open shop."

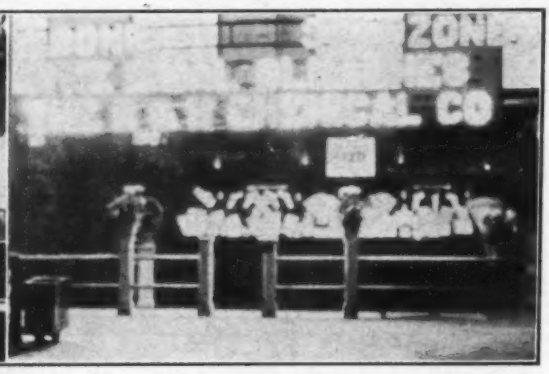
That they petition the Railroad Labor Board, in cooperation with the railroads and the employees thereof, to speedily effect such a downward revision of cost of railroad labor, etc., and other expenses as to parallel the deflation now taking place throughout the country, and thereby make possible a reduction in freight rates.

That the convention reiterate the pledge of the National Association of Hosiery and Underwear Manufacturers to oppose class legislation by all honorable and legitimate means in connection with the American dyestuff industry; that they demand absolute protection for the American dyestuff industry by adequate customs duties and by the rigid enforcement of laws prohibiting dumping and unfair practices.

A resolution was also adopted favoring the early enactment of a permanent tariff law whose rates of duty shall be sufficient to protect American producers from unfair



ECLIPSE TEXTILE DEVICES, INC.



R. & H. CHEMICAL CO.

competition in the markets of the United States arising from the cheaper production costs in foreign countries.

Another resolution adopted favored the abolishment of the excess profits tax and the substitution of a general sales tax, and urged national, state and municipal economy.

A further resolution approved the introduction of the "open price plan" as an addition to the Association's activities, and urged that it be so extended as to apply to manufacturers of all types of hosiery.

Another resolution was adopted commending to members and others the thoughtful consideration of the work in the organization in combatting proposed legislation believed to be inimical to the knitting and other textile trades and the public, in supplying statistical and market information, in providing facilities for assemblages and conferences of organized and unattached manufacturers, and in maintaining and conducting a claims, adjustment and collection bureau and reporting service.

A resolution gave it as the feeling of the Association that whenever brands, labels or other advertising means are used by manufacturers and attached to merchandise or its packing, or specified by distributors, the wording employed shall clearly indicate the character of the component parts thereof so as to be understandable to the general purchasing public; and that the members of the Association by all lawful means shall endeavor to secure the observation of the letter and spirit of the resolutions, and that the wilful misrepresentation of merchandise to the purchasing public be condemned by the Association.

Next on the program was the report of the nominating committee and the following officers and directors were unanimously elected:

President, S. D. Bausher, Reading, Pa.

1st Vice-President, D. L. Galbraith, Bay City, Mich.

2nd Vice-President, G. Oberlaender, Reading Pa.

Treasurer, Ernest Blood, Philadelphia.

Secretary, C. B. Carter, Philadelphia.

Board of Directors, (two years) Jos. Felden, Philadelphia; W. B. Davis, Fort Payne, Ala.; J. B. Lesher, Williamstown, Pa.; Geo. F. Dickson, Minneapolis, Minn.; (one year) Andrew Vaughan, Pottstown, Pa.

Speaking of his re-election, President Bausher said: I felt that I had failed so miserably in my first year that I had almost resolved that under no consideration would I accept the nomination or election to President for another year. I want to say to you that it places a responsibility upon me greater than I was able to bear, and the burden for the past three months, hustling with matters that did not turn out just as we expected them to, made it doubly burdensome for us, but after an interview and after a promise of real support from your new directorate and the assurance of some of the things that have gone adrift for us this year, I feel that next year we should have our entire oak tree again combined, and the sores that existed this year, I am at liberty to say, have practically been healed, and we look forward to next year as the real homecoming of the entire group which includes the manufacturers of machinery, the dye people, the chemical people, the seamless hosiery people and also the underwear people of this Association. That has relieved the pressure on my heart and mind very greatly today.

I am not at liberty to say that we are going to have this entire family together, but I feel in my heart that with the cooperation and the resolution passed, that the family again will worship under one roof. I want to thank you very kindly for the confidence manifested in me, and I am going to ask your support. I am going to ask your criticism, whether it is constructive or destructive. Do not be afraid to use the President, the Secretary, the office and the directors. We are your servants and the minute we do not qualify, do not be afraid to circulate a petition asking for the removal of the President if he is not on the job.

There being no further business, the convention then adjourned.

The Banquet.

On Thursday evening at 6:30 o'clock the knitters, the exhibitors and the friends of both gathered in the grand ball room at the Bellevue-Stratford for the annual banquet. Entertainment during the dinner was furnished by Dan McGarrigan's entertainment bureau. President Bausher acted as toastmaster and the speakers of the evening were Hon. J. Hampton Moore, Mayor of Philadelphia, and Hon. J. W. Fordney, of Michigan, Chairman of the Ways and Means Committee. The subject discussed was the tariff.

The Machinery Exhibit.

Owing to differences that we have reason to believe will soon be amicably adjusted, there were two exhibits this year. One was held on the 3rd floor of the Manufacturers' Club by the Knitting Machine Manufacturers' Association and the other was the usual show at the Commercial Museum. For reasons already given in connection with the convention, the attendance was extremely limited, but the exhibitors were a cheerful lot and the greatest regret expressed was that such excellent exhibits as had, in

some instances, been prepared should have been deprived of a larger number of visitors. A suggestion for a more congenial weather man for Philadelphia would undoubtedly meet with popular approval among the exhibitors.

Among the Exhibits.

Following are descriptions of some of the more attractive exhibits at both shows. Photographic reproductions of some of these are also shown:

The American Laundry Machinery Co., with specialty department at Norwood Station, Cincinnati, Ohio, was an exhibitor and had on display and in operation their usual interesting line of laundry and dyeing and finishing machinery. An especial feature of this exhibit was the new American over-driven, direct motor connected extractor which has just been brought out by this company. In this machine, the swinging curb principle well known to textile men has been preserved in the direct motor application on this machine; the motor is direct connected to the spindle of the basket in this manner eliminating loss of power

AMERICAN LAUNDRY MACHINERY CO.

through gears or belts. To eliminate accidents and so as to save labor an automatic starting and stopping device has been applied to this machine. The operator closes the safety cover of the machine, which automatically starts the motor. The timing gears on the machine are arranged so that the basket will revolve for any desired number of minutes. When this period is up, the timing gears set in motion a switch, which automatically shuts off the electric current and causes the electric brake to bring the basket to a stop. When the basket is at a dead stop the safety cover automatically opens itself, setting in operation a signal indicating to the operator that the machine is ready to be unloaded. The machine cannot operate while the safety door is open. The accompanying illustration shows this machine in running position, with the safety door closed to prevent accidents.

Another feature of this exhibit was the all monel metal rotary dyeing machine which is constructed with an outer tank of "U" shape, the inside cylinder is subdivided by three monel metal partitions forming a "Y" which equally divides the cylinder. This machine is motor equipped. Also included in the exhibit were an American underwear finishing press, knit fabric calender and rotary hosiery press. W. S. Taylor, manager of the specialty department, was in attendance at the display during the week, and other representatives present were as follows: G. G. Rups, G. L. Wenzell, H. G. Mayer, the southern agent, R. B. DeLind, A. I. Colman.

American Water Softener Company, Lehigh Avenue at Fourth Street, Philadelphia, manufacturers of water softening and filtration plants, had on display a model of the "DecAlso" water softening apparatus with which were conducted demonstrations to show the importance and value of soft water for textile mill purposes. John B. Price, sales engineer, was in charge of this exhibit, and other representatives of the company were in attendance during the show.

ELECTRO BLEACHING GAS CO.

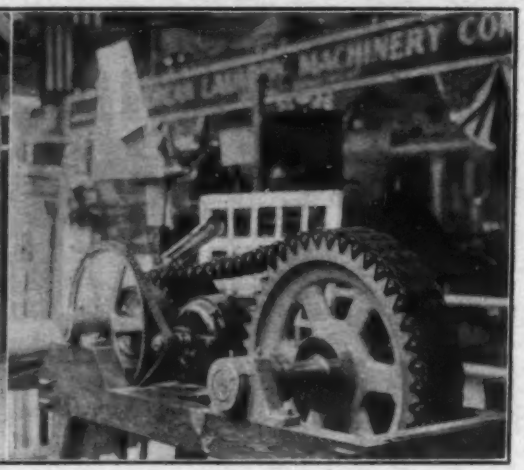
American Yarn & Processing Co., yarn spinners and mercerizers, Mt. Holly, N. C., maintained space for the reception of friends and customers. This organization was also represented at the Show by Forrest Brothers, the Philadelphia representatives. The man in charge of this booth was J. M. Hatch, manager.

Diamond State Fiber Co., Bridgeport, Pa., were showing their line of fiber mill receptacles for textile mill use in their booth, and their exhibit also included a number of specialties—such as roller coverings, loom gears, swift braces, cup washers, pot eyes, fiber spool heads, etc.—especially produced for textile mill use. Chas. S. Pressel was in charge of this exhibit, being assisted by E. C. Fisher and J. A. Kelley.

E. I. du Pont de Nemours & Co., Wilmington, Del., presented an interesting and unique display. Effective displays were shown of hosiery made in different sections of the country and dyed with du Pont dyes. A special electric lighting arrangement made it possible to view the different samples of hosiery with the same effect as in natural light.

Sulphogene Carbon H, concentrated, a new product just recently introduced by this company, secured an especial interest from visitors. This is a sulphur black of high concentration. It has the depth and characteristic shade of aniline black, known to the trade as oxidized black, and has the rich jet overtone which has been strived for by foreign and domestic manufacturers. It is claimed to have the advantages of shade and tone of the oxidized black with none of its objectionable features. They were also showing a full line of Pontamine Pontacyl for dyeing cotton and union goods. R. A. (Bob) Carter was in charge and

E. I. DU PONT DE NEMOURS & CO.



MORSE CHAIN CO.

among those in attendance at this exhibit were C. C. W. Wilson, W. C. Beattie, Charles Hagelgans, J. K. Burwell, Wm. Janney, Warren Hefferron, A. E. Kennedy, Jr., and H. D. Corkson, of Philadelphia; Kenneth Park, of Boston; N. A. Staugh, A. F. Black and R. W. Glenn, of Charlotte; C. H. Hudson, of Providence; Mr. Newcombe, of Chicago; and C. Protto, Mr. Harrington and J. C. Bentley, of Wilmington.

Eclipse Textile Devices, Inc., Elmira, N. Y., were demonstrating the effective functioning of their Eclipse stop motion device for spinning frames. This device is designed to be attached to spinning frames, and when a thread breaks on the spindle bobbin, the thread guide moves upward, which causes the stop motion to function and sever the roving back of the rolls. To piece up the broken end the operator lifts the stop motion and inserts the broken roving into the roving guide, then takes the bobbin from the spindle and pieces the end in the usual manner. In piecing the end, the stop motion is automatically placed in operating position. This is a positive function of the device which insures a correct position of the stop motion at all times.

The doffing board is located under the thread guide and is of angular shape. If any clear waste or other imperfections drop down on the board they are held and cannot become drafted back on the running thread. When the frame is stopped for doffing, the stop motions are automatically locked. The device is simple and sturdy in construction, and easily adjusted in relation to the bobbin spindle.

It is stated that by the use of the device a saving of 90 per cent in waste on the front of the rolls is secured; that there is a saving of 75 per cent in top roll coverings; that there is a saving of at least 40 per cent in the labor cost of spinning, by increasing the number of sides tended by a spinner, and decreasing the number of ends to piece; and that there is a 95 per cent perfect condition of the leather rolls and fluted steel rolls. It is a device that practically makes the ring frame automatic. In charge of this exhibit were John C. Ferguson and J. P. Garey. Others present were Jay B. Stuart, Henry Fanning, Peter Brown and John Lutes.

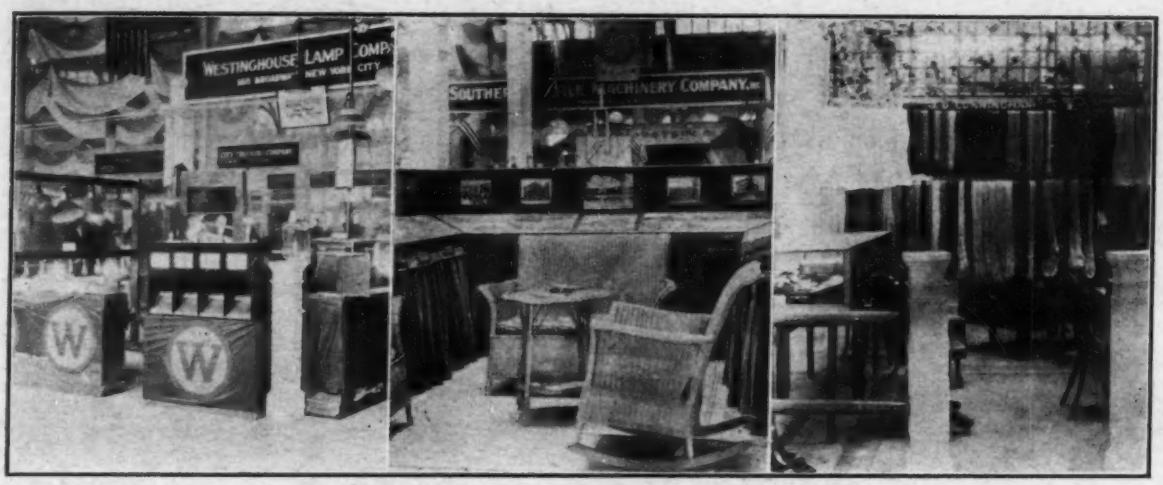
Electro Bleaching Gas Co., New York City, had their usual interesting display of samples of work bleached by well known manufacturers using "Liquid Chlorine" for this purpose. J. B. Duggan and W. A. Kennedy were present throughout the week.

Flexible Steel Lacing Co., Chicago, Ill., had in demonstration their Alligator steel belt lacing, showing the operation of this equipment with its simple and effective method of joining belts. Also exhibited in this space were Flexco-Lok and Flexco lamp guards for electric lamps, made from expanded steel; high duty belt fasteners for heavy conveyor belting, etc. H. L. Coats, sales manager of the company, was in charge of this booth, greeting old friends and making new ones.

H. A. Florsheim, New York City, general sales manager for the group of fine combed yarn mills at Gastonia, N. C., comprising the Gray Mfg. Co.; the Parkdale Mills, Inc.; the Flint Mfg. Co.; the Arlington Cotton Mills; the Arrow Mills, Inc.; the Myrtle Mills, Inc.; and the Arkray Mills, Inc., occupied a booth where an interesting line of samples of the products of these mills was on exhibition. These mills spin a complete range of knitting yarns in sizes from 30/1s to 80/1s, and lisle and mercerizing two-ply yarns in the same range of counts. They specialize on a line of looping thread which they sell in the natural; also double carded peeler yarns in sizes from 30s to 50s, in single and ply. Mr. Florsheim was in personal attendance, and others present during the week included H. D. Skinner, New England representative; J. H. Strigner, Metropolitan representative; Thomas Behan, Jr., Pennsylvania representative; and H. M. Boshamer, Western representative. J. H. Separk, secretary and treasurer of the foregoing mills, and J. L. Gray, vice-president and general superintendent, were in attendance during the convention.

Fletcher Works, Philadelphia, Pa., included in their exhibit this year a 42-inch E. U. type extractor, equipped with ball bearings, push button control, interlocking brake. They also showed a 26-inch standard type with vertical motor drive. Photographs and drawings were shown of a new steam turbine driven extractor for which many advantages are claimed. The exhibit was in charge of C. William Schaum, and L. H. MacLaughlin, L. Griscom and W. T. MacDonald were other representatives of the company in attendance.

J. B. Ford Company, Wyandotte, Mich., manufacturers of the well known "Wyandotte" line of textile chemicals,



WESTINGHOUSE LAMP CO. LOCKWOOD, GREENE & CO. J. B. FORD CO.

showed in a very interesting display a complete line of wool, cotton and silk yarns, and hosiery and underwear, showing the results obtained by the use of "Wyandotte" products in dyeing, bleaching and scouring. F. S. Klebart, field manager, was in charge of the exhibit. Mr. Klebart was assisted by W. E. Ratz and John W. Turner.

Kali Manufacturing Co., 1410 N. Front St., Philadelphia, Pa., makers of "Kali Neutralizer' for removing chlorine from bleached fabrics, "Developene" for finishing blacker dyed goods and also makers of all chemicals needed by the dyer or bleacher, occupied a decorated booth in the center of the hall. Their well known "Hydroxy oils" needed no introduction, and they displayed a full line of chemicals used by the dyers and which are manufactured by them, including boil-off oil, kier oil, soap, softeners, sulphide of soda, Glauber's salt, acetate of soda, acetic acid, formic acid, oil of vitriol, bichloride of tin, formaldehyde, ammonia, etc. Chemical questions were answered free of charge by the expert chemist in attendance at this booth.

Fabrics treated with Kali chemicals were on exhibition including hosiery finished with "Developene;" bleached goods finished with "Kali Neutralizer;" silk piece goods degummed with boil-off oil and others. A feature at this booth was sheet iron buckets and dippers covered with lead by a new process by which the lead is hardened to the iron. These buckets and dippers are entirely new and a big improvement over the old-fashioned pitcher for handling acids in the dyehouse. James A. (Jimmy) Branegan, president of the company, and S. G. Davenport, treasurer, were in attendance at this booth, as was C. C. Burt, the New York representative.

Kaumagraph Co., New York City, gave demonstrations at their booth of the methods of using the dry transfer stamps for trade-marking hosiery and underwear, etc., and included in their display were the goods of several well known lines which use this system of trade mark dry transfer stamps. H. A. Keech, Philadelphia representative, had charge of the exhibit, and Trowbridge Marston, who is secretary of the company, was present from the New York office.

Link-Belt Co., Philadelphia, Pa., had in operation several types of Link-Belt silent chain drives which they manufacture, putting emphasis on the application and use of this drive in knitting mills. A stereomotorgraph, their usual feature at exhibitions, showed various views of the manufacturing processes in the construction of the chain. Also in operation, at high speed, was a silent chain drive from a 7½ hp. motor to a line shaft. The exhibit was in charge of H. D. Mitchell.

Lockwood, Greene & Co., engineers, with main offices in Boston, Mass., had provided an attractively decorated space, showing illustrations of the modern development in knit goods plants, erected under the supervision of this organization. S. B. Lincoln, resident director of the Chicago district, was in attendance during the week, and was assisted by M. W. Weeden, specialist on dyeing and finishing processes, and C. P. Wood, manager of the Philadelphia office. W. H. Rose was present during the Show. W. C. Clark, from the Atlanta office, was in constant attendance.

Merrow Machine Co., Hartford, Conn., with Philadelphia office located at Sixth and Arch Sts., had in operation standard models of various types of their machines and were also distributing catalogs, instruction books and samples of work from the large range of their overseaming, overedging and shell stitch machines. Several of their better known models are Style 60D, two and three thread machines, for seaming and edging knitted underwear; Style 60HD for hemming balbriggan shirts; Style 60AD and 60ADSS for finishing sweaters; Style 60S for welting the tops of ladies' stockings; Style 60UD for toe closing, "mock seaming" and clocking, etc. E. H. Allen, manager of the Philadelphia office, was in charge of the exhibit, being assisted by W. J. Longley and J. B. Tolan, both well known to the trade.

Monroe Calculating Machine Co., Orange, N. J., were among the exhibitors and were demonstrating the latest model Monroe calculating machine and calling attention to its application in textile mill work. The exhibit was in charge of John R. Ramsey, and others in attendance were J. V. Carroll, G. W. Borden, J. E. Price and E. F. Heydt.

Morse Chain Co., Ithaca, N. Y., had an operating exhibit this year which featured a Morse rocker joint silent chain drive of two-inch pitch by five inches wide, capable of transmitting 100 hp. and withstanding 100 per cent over-load. The chain was provided with guiding links, ran over sprocket wheels mounted on a heavy frame work, and driven by a small motor connected up through a small

NATIONAL ANILINE & CHEMICAL CO.

chain drive. This large chain appears in the photograph of this exhibit to be found elsewhere in this number. The rocking action of the joint in the chain could be followed as the chain went on and off the sprockets, as the washers of the chain were removed from one side and a revolving shutter arranged for the purpose. Also exhibited were other small drives that are being installed in textile mills for connecting individual motors to spinning and twisting frames, etc., showing the type of case recommended by the company and the method of lubrication. Samples were also shown of different chains of from ½ inch pitch to 3 inch pitch, in several widths, illustrating the chain as used for ½ hp. up to 5,000 hp. M. H. Rodda, manager of the Philadelphia office, was in charge of this exhibit, and H. E. Matthews, sales engineer, from the Charlotte office was also in attendance.

Morehead Manufacturing Co., Detroit, Mich., manufacturers of the Morehead steam trap, showed a return type of machine designed and used for drainage of all kinds of steam heated apparatus, such as drying forms, heating systems, etc., handling condensation and returning it to the boiler at it forms as pure hot feed water. Also on display was a photographic reproduction of a recording thermometer temperature chart, taken from the boiler feed lines of a well known mill, to demonstrate the reduction in fuel cost obtained through the use of this apparatus. H. A. Bogardus and J. H. Whittaker represented the company at this exhibit.

National Aniline & Chemical Co., Inc., New York City, had their usual elaborate display which presented to the visitor the varied uses for which National dyes are employed in the several branches of the knitting industry. Knitted fabrics of all kinds, comprising cotton, wool, silk, artificial silk, etc., ranging from the finer textured glove material, to the heavier sweaters and other knitted outer garments, were shown. There was also an extensive array of socks, stockings, bathing suits, including yarns, etc., in all colors, which illustrated every process of dyeing. The booth was in a very prominent position at the end of the central aisle of the building, and was decorated in harmony with the general scheme of the building. Dr. L. J. Matos, of the technical staff of the company, was in charge, being assisted by W. H. Willard from the Charlotte office, and S. W. Wood, of Philadelphia, together with a corps of technical and sales men representing every branch of the company.

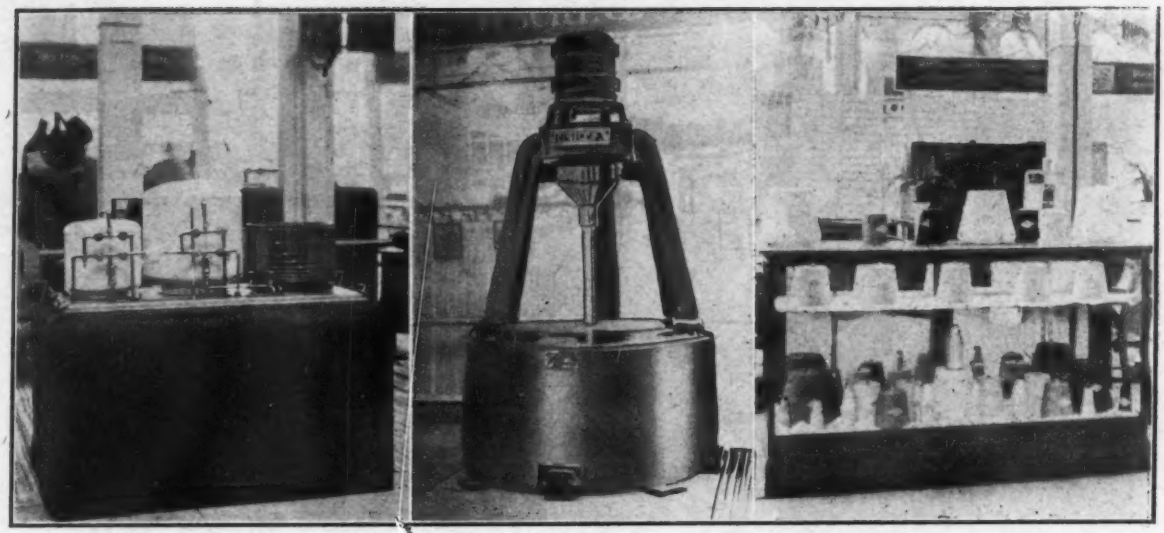
Charles B. Paulus, Philadelphia, maintained his usual reception space for friends and customers to talk over the questions of knitting needles, transfer points, sinkers, etc., which he handles for the knitting trade.

The Permutit Co., New York City, had on exhibit a miniature model of their water softening and filtering equipment for use in textile mills. This model was about four feet long and was made precisely to scale following the design of a large commercial unit which delivers 100,000 gallons of soft water per day. Representatives of the company were present.

Philadelphia Drying Machinery Co., Philadelphia, had their usual exhibit showing models in operation of two of the types of Hurricane dryers used. These were the Hurricane truck yarn dryer and the Hurricane automatic looping and drying machine. Also on display was an illuminated photo display case showing photographs of the various types and installations of Hurricane machinery for drying, dyeing and finishing all classes of textiles. W. W. Sibson, secretary and treasurer of the company, was in charge of the exhibit, being assisted by H. O. Kaufmann and S. Watson.

Proctor & Schwartz (formerly Philadelphia Textile Machinery Co.), Philadelphia, were demonstrating their Proctor automatic boarding, drying and stripping machine, for boarding ladies' full fashioned silk stockings, etc. In addition, the company were showing photographs of other types of Proctor dryers for all textile materials. Fred Kershaw, general sales manager, was in charge, and others present were Charles T. Griffith, manager hosiery dryer department; J. W. Claghorn, advertising manager; Charles S. Tiers, Paul G. Kent, W. H. Rihl, H. Morshead, Fred Klenk and Joseph Moranz.

R. & H. Chemical Co., New York City, presented their usual well arranged exhibit showing samples of different knitted products and yarn bleached with peroxide, and representatives were directing attention to the fact that this operation can be performed in one day, instead of the usual boiling-off in a kier and bleaching in chemic, requiring



PERMUTIT CO. TOLHURST MACHINE WORKS. UNIVERSAL WINDING CO.

three days for finishing a lot. G. W. Kuehler, in charge of the peroxide department, was in attendance, as were H. L. Ariente and Thomas D. Ainslie. Milton Kutz was also present.

Signode System, Inc., Chicago, were exhibiting in conjunction with their Philadelphia representatives, the Steel & Wire Products Co. The exhibit showed the Signode system of nailless strapping for boxes, bundles and bales, applied without nails, rivets or buckles. A special feature was the showing of Signodes which can be furnished in any color to correspond to the insignia or trade-mark of the shipper. The Lovingood Co., Atlanta, handle these products in the southern section. Representatives of the Philadelphia concern were present at this exhibit.

Tolhurst Machine Works, Troy, N. Y., manufacturers of centrifugal hydro-extractors, had an exhibit this year which featured a new 48-inch self-balancing hydro-extractor prepared especially for use in knit goods and allied trades, in actual operation and driven by a direct connected motor. Of special note in connection with this exhibit was the fact that this machine was not fastened to the floor, and yet with an unbalanced load of about 20 pounds on one side of the basket, it was operating at full speed without vibration. R. K. Cheney, sales manager, was in charge of the exhibit and others present were Wilmer C. Dutton, vice-president and manager of the New York office, and John McKeon.

J. Spencer Turner Co., dealers in cotton yarns, New York, maintained reception space at the exhibition for entertaining visitors. Cotton quotations were posted hourly for the benefit of those interested. The booth was in charge of J. E. Arters.

A. Klipstein & Co., New York City, were showing a display of their products, and also exhibited samples of yarn and goods on which their products had been used. Among the products exhibited were anilines, dyestuffs, chemicals, oils, etc., for textile use. S. J. Margargle was in charge of the booth, and was assisted by Paul F. Haddock, the southern manager, T. B. Meisenheimer, W. R. Smith, F. R. Livingstone, Richard Haiworth, A. R. Rittger, W. R. Dempster, T. J. Clexton and P. Anderson.

Universal Winding Co., Boston, Mass., did not have an operating exhibit this year, but maintained reception space where they welcomed the visiting manufacturers desiring to discuss winding problems. They showed a large number of sample cones, including the No. 80 cone for underwear and all heavy yarns; the No. 90 eight-inch wood cone and No. 90 splicer bobbins. Frederick H. Bishop was present at this exhibit, as was F. J. Quinn.

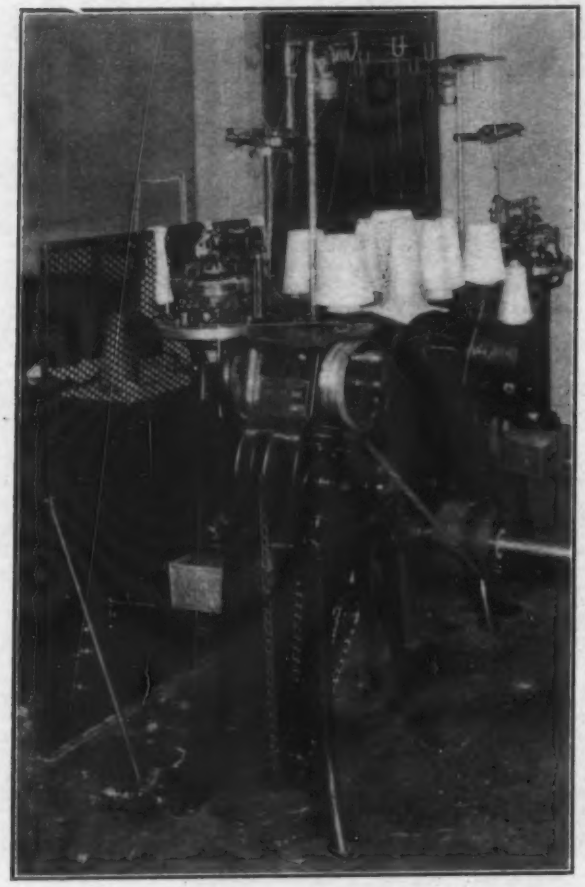
Westinghouse Lamp Co., New York City, were showing various types of lamps recommended for mill use in securing proper lighting effects. These included the mill type lamp on a specially designed device to withstand considerable vibration and jolts; a cabinet showing the effect on colors with the various types of incandescent lamps; and an industrial light cabinet showing various types of lamps for textile mill illumination with reflectors. Perry E. Hurd, illuminating engineer, with headquarters in Philadelphia, was in charge, and James Conner was in attendance.

H. Brinton Co., Philadelphia, were showing in operation five knitting machines manufactured by them, including the 5½-inch single feed selvage welt ribber of 440 needles making rib top ladies hosiery, and another making an 8-inch scarf; one 3½-inch Model C hosiery knitting machine of 220 needles, making rib top ladies hosiery; one 1¾-inch necktie machine equipped for making fancy stripes and varied effects; and one 15-inch 14-cut body machine for underwear, with six feeds. H. S. Horrocks was in charge of the exhibit, and others in attendance during the week were W. H. Allerton, Edw. Newell and R. L. Brinton.

Hemphill Co., Pawtucket, R. I., were showing four types of "Banner" hosiery machines, with a number of new features. These were one 160-needle machine, 3¾ inch, 36-gauge half-hose combination containing a new style imitation drop stitch attachment for making this staple; one 110-needle, 2¼-inch, 48-gauge machine making plain half-hose, and equipped with the latest type tipping attachment; one 240-needle, 3½-inch, 48-gauge spring needle machine of the latest type making ladies combination hose, with mock seam attachment; one 240-needle 3½-inch, 54-gauge machine. John Lawson, president and general manager of the company, was present for a few days, and

others at the exhibit during the week were M. L. Frost, E. M. Gunning, George McDowell, L. E. Bean, Frank Jones, Herbert Goslin, Emil Bedard, F. B. Martinez and others.

Scott & Williams, Inc., New York City, were featuring in their exhibit their latest model machine which has just been brought out by them. This is known as Model H-H and is especially shown in the exhibit photo. It makes half hose automatically, and is equipped with two sets of needles, one set being carried by a dial, the other being carried by a cylinder. It knits the usual one and one rib fabrics for any desired extent for a rib top, and then auto-



SCOTT & WILLIAMS.

matically changes from rib to plain by transferring the stitches from the dial needles to the cylinder needles, thus avoiding all hand transfer operations. The dial needles are of novel construction and have no latches or rivets. With the needles in the machine bare of fabric, the machine starts knitting a stocking by introducing a thread first to a cylinder and then to a dial needle and then immediately proceeds to knit what is known as a "French welt," which can, of course, be made of any length desired. They were also showing their Model K machine which was shown with their improved sinker or web-holder. Also included in the exhibit was a full line of hosiery knitting machines of various types and gauges, also their plain and automatic ribbed body machines for making fine gauge underwear fabrics. The exhibit was in charge of Fred W. Smith, and assisting him were Harry Swinglehurst, J. D. Morley, F. W. Richardson, L. Lepicier, Walter L. Toy, William Swinglehurst and F. C. Heine.

Wildman Mfg. Co., Norristown, Pa., exhibited six of their circular knitting machines, and were demonstrating the recent improvements made on various types of their line of knitting machinery. Included in their exhibit was one plain rib body machine, 18-inch; one fine cut spring needle machine 16 or 18 inches, with 28 needles; one spring needle striping machine working on a special design for making patterns; one spring needle machine, 3½ inch, 240 needle on half hose; one spring needle machine, 3¾ inch, 260 needle on ladies hosiery; one French welt rib machine, 240 needle, making tops. Kenneth Howie, general manager, D. Bellis, E. S. Kennedy, F. E. Paul and F. Lochton were present at this exhibit.

The Lovingood Company, Inc., 14 Walker Street, Atlanta, Ga., which is a factories branch for all kinds of modern shipping room and factory equipment and labor saving devices, has recently issued Catalog No. 1, which presents in a general way the company's extensive line of shipping room supplies and devices and appliances for securing, handling, marking and conveying all kinds of packages—from bale ties and buckles to watchmen's clocks, and including box strapping, stencil machines and stencils, conveyors, elevating floor trucks, electric trucks, gummed slasher tape, gravity roller merchandise and spiral conveyors, one-man trucks, waste paper balers, textile scales, tiering machines, etc.

This company is the branch of several nationally known manufacturers and carries closely allied lines for use in the shipping room and manufacturing plant. It is the purpose of the organization to centralize into one source of supply all of the many items for shipping room and factory use, that usually require a lot of time to locate; in other words, to provide a convenient distributing point for well known manufacturers, carrying these goods in stock for the convenience of the southern trade, and thereby give the best possible service.

The catalog has been prepared in a convenient form, is well illustrated and contains 48 pages. It is said to be the first catalog to be issued describing under one cover such an extensive list of shipping room and factory supplies and modern labor saving devices, compiled and arranged for the convenience of the purchaser.

Atlantic Yellow R, a clear reddish sulphur yellow of standard properties, has just been put on the market by the Atlantic Dyestuff Company. This company feels that with the addition of this sulphur yellow to their present line of this class of colors, there is no occasion for the further importation of sulphur yellows.

It is generally conceded that unprofitable lines should be discontinued. Where a variety of articles are manufactured in a single plant a cost system offers the only opportunity for determining positively those lines which are not profitable. Where a single article is manufactured timely information regarding costs can forestall a calamity.

When a business operates without a cost system, it is in the same position as a boat without a rudder, tossed about by the winds and directed by sources outside of those supposed to be in control, and driven towards an end which is not definite and perhaps not the one desired.

The Knit Goods Market

Weather conditions of May blew both hot and cold on the knit goods market, but the month as a whole witnessed a sharp recovery in a number of lines, others being left about where they were.

So sensitive is the market in response to climatic changes that during the cold, rainy days of the fore part of the month there was a noticeable decline in the buying of light weight underwear for even spot delivery. The consumer was hanging on to the winter garments and retailers, and jobbers in turn, behaved as though they felt in the transition from one season to another spring might be skipped. It seems to have been the policy to buy only a dozen as a dozen was sold, and the jobber reasoned in like manner as to cases, continuing to purchase for 30 to 60 days requirements.

Whether jobbers gauged their buying by the attitude of the retailer or the latter was psychologically influenced by the ultra-conservatism of the wholesaler seems to be a question neither side seeks to answer. But it is pretty certain that if the jobber were to put a bit more jazz into the market the retailer would perk up.

Buyers for the large jobbing houses charge their overcautious buying to the merchandise managers. The latter, it is said, frequently will put his o. k. on a buyer's requisition for a 30 days' supply amounting to perhaps $10,000, yet would withhold permission to buy $6,000 or $7,000 worth of an identical line of goods for fall. Dealers are more scary than manufacturers. Otherwise there would be no stocks from which to draw for immediate delivery, the basis on which most wholesalers are taking year-around hosiery and underwear for summer.

Hosiery took a decided spurt in May, due mainly to a famine of full fashioned silk and the resultant rush for seamless made with the seamed leg in imitation of the full fashioned. One of the large mills making the latter, for women exclusively, early in the month announced prices for the last four months of the year, one number showing an advance of 75 cents a dozen. Those of the mill's customers who received the announcement were informed that production would have to be allotted; that so soon as their respective requirements had been received the output would be apportioned among jobbers in a manner for equalizing pressure on the mill, which in the present conditions easily could dispose of twice its maximum production.

The idleness of sixteen full fashioned mills since December last, manufacturers refusing to yield to the unionized operatives on strike against a 15 per cent wage reduction from the highest scale ever paid, and for complete recognition of the union, which mean workers' control of the mills, is responsible for the scarcity of fashioned seamed stockings. Several mills a month or so ago surrendered to the unions and left the others to fight their battle, a battle that must be fought out some time, and better now than later. It is this sort of lack of cohesiveness in the knitting trades that is the cause of many of the evils and perpetual confusion.

The mills which the unions have caused to be idle for more than four months have served notice that when they resume it will be on the open shop basis. They are training help, something which ought to have been thought of earlier but which the unions would not have permitted, for it is one of the rules of the autocracy in knitting mill labor that there shall be no apprentices or learners. A number of non-union mills for some years have been training help, several at an added expenditure of $500 to $1,000 a month, and usually have had all the knitters, toppers and loopers they required. But here again the littleness of some manufacturers was revealed, it being shown that mills which had been giving no attention to the employment of learners would, by devious methods, induce skilled operatives to leave the employ of manufacturers who had the foresight to teach knitters. The Golden Rule is a dead letter in a great part of the hosiery manufacturing trade, but it is reported working out satisfactorily among the organized manufacturers of the South.

One of the Central West hosiery mills which always has in its employ a complement of learners not only teaches them the art of knitting, but makes them feel they are a part of the working organization. So strongly do these learners, as they progress under a tutelage that encourages, become attached to the mill that, it is stated, competing manufacturers have found it practically impossible to coax them away. The result: the mill suffers little or none from labor dissatisfaction and has help aplenty while others, neglecting to profit by the cost of their turnover, are looking for it.

Some of the Philadelphia seamless hosiery mills are well supplied with help; many are in want, as was indicated by the appearance of advertisements of 23 mills in a very recent issue of an evening newspaper, for knitters, toppers, welters and menders. These mills had felt the effect of the somewhat sudden better call for hosiery and were not at the moment prepared to meet it.

A mill in Illinois contemplates operating two ten-hour shifts beginning with production for July, August and September. The mill, about the middle of May, withdrew its lines, having sold up, to June 30, of combed, silk, mercerized and artificial silk lines for men and women. The hosiery from this mill is shaped like a fashioned stocking but does not have the seamed leg. It sells for what it is; not for what it is not, and throughout the period of the slump has enjoyed a good run.

Another mill to withdraw lines and prices in May was the Durham, which first came out with an announcement it would sell at value at date of delivery, for the latter part of the year. Subsequently the lines were taken off the market entirely, pending the making of new prices. These were announced the third week in the month. Meanwhile the Durham had sold heavily, disposing of a large quantity of stock which had accumulated during the six months of suspended buying.

The Ipswich (Mass.) Mills, which two months ago disposed of about 5,000 cases of hosiery at auction and got rid of an accumulation that seemed to worry distributors, also has been booking orders for about 70 per cent of maximum production, about all that can be turned off under present help conditions. Thus the better situation in the market is at once reflected in a number of mills, these not including many of those producing low end cotton goods exclusively. This class of hosiery shows little improvement.

Prices of carded and combed cotton hosiery for both men and women are too low by a dime or more a dozen,

and prices are so unsettled that dealers are not inclined to operate far beyond known needs. A few mills favored with extra low overhead may be able to sell misses' coarse gauge ribs at 90 cents a dozen on size 7, but it is doubtful if in doing so they are able to lay aside the equivalent of the depreciation in machinery. It seems to be overlooked that knitting mill machines will wear out, and, whether they do or not, will have to be replaced, for the machine of several years ago now is obsolete and, at the rate of improvement in machine construction, today's model will be forced out a few years hence, if manufacturers are to hold their position among competitors here and abroad.

Some jobbers will tell you they can buy coarse ribs at 87½ cents, and probably they can, for some manufacturers are prone to take for granted what a buyer says and are too ready to sacrifice for preventing some other mill getting business that really is not worth going after. Price irregularity is retarding a return to a wholesome market for cheap cotton hosiery.

Carded half hose of 176 needle, worth easily one dollar a dozen, and frequently sold at that by mills having an established relationship with desirable jobbers, are offered at 90 cents, and have been sold as low as 87½. Whether the jobber buys the stocking at 90 cents or a dollar a dozen, it goes to the consumer at the same price, so that somewhere the difference of ten cents, which ought to go to the mill as a return for capital investment and business hazard, is absorbed. As neither the mill nor the consumer gets it, logically it goes to swell the profits of either the jobber or retailer. The mill selling at 90 cents, a stocking on which the market on a low basis is one dollar, on a production of 500 dozens a day is giving away $50 a day—$15,000 a year of 300 working days.

A Pennsylvania mill is getting a dollar a dozen for 144 needle cotton half hose in bundles, five cents extra when packed in half-dozen boxes. Some of the mills in the same state are selling at 85 cents, bundled, and no questions asked. But the dollar stocking is worth the difference, and the mill making it is having as much business, relatively as either of those putting out the 85 cent product. One sells at fifteen cents in retail stores; the other, two pairs for a quarter. The point is here: if each of the mills making the 85 cent sock matched the dollar one, all would sell as readily at the higher figure as the latter now does or the former at the lower price. Stabilization of product would hasten stabilization of prices.

Haphazard naming of prices and leaving a loophole by which a tricky buyer may crawl out of a contract are factors in the unsettled condition of the cheap cotton hosiery market. Two New York commission houses cancelled orders in May for the reason given delivery was late. As a matter of fact the buyers themselves made it impossible for the mills to ship within two weeks, the period usually contemplated when a spot order is accepted. Both used the same tactics. They specified bands, labels and rider tickets, which they were to supply. Neither did supply the printed matter and, not having done so, the mills could not deliver, as had the goods gone forward without the packing specified they would not have been accepted. Both of the mills involved in the transactions simply made the best of a bad situation—accepted cancellation and added two names to the Undesirable list. Neither of the two commission houses would be given the slightest attention in the office of either mill.

Plain mock seam mercerized hosiery is perhaps a somewhat better merchandising proposition than carded goods, but here again there is absence of price foundation. It may have been a business expedient that persuaded the Durham mills to go below what was believed to be the bottom for men's and women's mercerized hosiery. Nevertheless, the mill was criticized in the trade for making prices alleged to be unduly low. However, the mills sold carloads of stockings, as was attested in the withdrawal from the market for a week or two. Very soon after the Durham prices had been announced an all-mercerized half hose from a large northern mill made its appearance, at $1.59 a dozen. This was under the Durham price and caused something of a sensation. But sensations in the hosiery market in the last twelve months have been short lived, even when they cropped out in an improved fabric or better finish.

Soon after the scarcity of full fashioned hosiery became acute a northern mill brought out a ladies stocking of all silk and a silk boot with mercerized top, heel and sole, both numbers representing the nearest approach to the full fashioned that has yet been attained. The stocking has a well shaped leg, so knitted as to provide a snug fit, with a degree of tension that contributes to perfection of shape. Much attention to elasticity also is given to the hem, which is tight without being uncomfortable, the construction throughout making the stocking a very strong competitor of the average full fashioned.

It is coming to be suspected that considerable of the silk hosiery being sold over the counter for full fashioned is the plebeian seamless aristocratized with the seam and embellishments. It is estimated that by reason of the long strike the loss of production of full fashioned since January amounts to more than 700,000 dozens. Yet there is no lack of "fashioned" hosiery at the counter, and as there has been a big movement of seamless silks in the primary market it is reasoned much of this class of goods has reached the retail store, where full fashion prices still prevail.

Seamless silks for women selling around $16 a dozen during the boom period now command around $10 for boot, to $12 for all silk, and desirable lines are not begging a market. A very good seamless stocking comes from a mill in New Jersey. The mill, having sold up for several months, now is increasing output and is accepting business for fall. A Michigan mill is getting $10.50 a dozen from jobbers for a very high grade stocking of 21 inch silk boot. Stockings with a short boot are to be had around $8 a dozen and have a good sale.

A recent innovation in hosiery for women is an all-over artificial silk plated on mercerized yarn. The mill price to jobbers is $6.75 a dozen for trying the stocking out. Persons in the trade who have looked it over regard it a good number.

As half hose, in practically all lines except full fashioned and high grade seamless double sole combed, have been dragging, several manufacturers have conceived the idea of seaming the leg, for giving the stocking the appearance of the full fashioned. This was tried out with a single sole combed to accommodate a venturesome jobber, but the stocking made no great hit, although priced $1.40, while a double sole and high-splice heel combed sock was selling by one mill at $1.75.

One objection to the seaming of half hose, with the exception perhaps of artificial silk, is that it would involve detail in manufacture that would yield no adequate return

since there would be an increase in cost, while the disposition is to reduce cost, while supplying the best possible fabric and finish. Furthermore, it is felt the clocked and otherwise embroidered sock fills the want as between plain seamless and full fashioned.

Fads may be a good thing to take up after they have been tried out and won favor, and even then may prove a costly undertaking, unless abandoned when at the height of their popularity. Fads in hosiery cease to be attractive after they have appealed to the masses, and are no more to be depended on for stable business than freaks and the extremes in outer wear.

Just now a number of mills are having boom business in women's mercerized stockings made with drop stitch and chiffon effect. Probably not one mill so engaged is able to supply demand, and fancy hosiery of this type is bringing fancy prices. More of it will be made as pressure on mills continue, necessarily, and a little later those who got into the game late will wish they never had heard of it. For the present the fancies in mercerized are having a depressing effect on the market for women's plain mock seam mercerized. A very high grade stocking in the latter class is sold up to September at a very low price—$3.25 a dozen to jobbers. The mill was selling until recently at $3.50 for immediate delivery. A few orders still are being taken at that figure, for absolute spot, short term.

Leaving out fancies and full fashioned, the better selling hosiery numbers are seamless silk, infants fancy top and cashmere socks and artificial silk. Infants socks are sold far ahead and immediate delivery goods are hard to find. Misses mercerized and fine gauge combed ribs are fairly good sellers, the latter around $1.65. A mill in Pennsylvania is selling a double carded fine gauge misses' at $1.75. The stocking enjoys a good standing in the trade.

The two market extremes are seen in underwear for spring and for fall. In light weights the mills are approaching the tail end of their season, yet jobbers continue to take for only a few weeks requirements. "Immediate delivery" is written on practically every order. Many mills lost several months production, but some have been working overtime and still are not abreast with orders. Stocks which accumulated during the early part of the winter have been absorbed and the market is in rather good shape from the mill viewpoint.

The big part of the volume of business in spring underwear is in women's garments, more especially the cotton ribbed vests. Men have a growing weakness for the athletic type of summer underwear, and their leaning toward nainsook is having an adverse effect on knitted lines, particularly the bal briggan shirts and drawers, in which there recently was a disturbing price cut from which the trade has not altogether recovered.

It is a peculiarity of many jobbers that, while they may not be able to locate goods for at-once delivery they will not buy for the succeeding month, preferring to wait and buy then for immediate. There is a suspicion that some jobbers will get less light underwear than they will want, and it is not improbable that late in the season, jobbers will sell to other jobbers at what a few months ago would have been regarded profiteering prices. No one is buying for speculation, to be sure, but it looks as though there will be opportunity for some large-lot turnovers, at prices which will make those obtained by mills look humiliatingly low.

Several Pennsylvania manufacturers of women's summer underwear have been nosing about in the yarn market, talking of deliveries commencing in September, for operating in anticipation of another tight situation next spring. These manufacturers feel—and probably are right—that cotton yarns can be bought for as little or less money now than a few months hence, and that as this year's production of light weight garments promises to be entirely absorbed there will be little risk in piling up stock for next year. This is not to be encouraged. These same mills have had a prosperous season and comparatively plain sailing for five months because, and only because, there were comparatively light accumulations when first jobbers came to market. They might profit by going ahead, as in normal times, but the chances are jobbers will be quick to take an advantage of accumulations, if they exist, when they begin talking underwear for the spring of 1922, a season that, in the present world disturbance, with many domestic problems to be solved, is a long way off. Jobbers have taken the bit in their teeth in the matter of buying as they sell. Experience has shown that it is safer to make as distributors buy. Mills had no accumulations of heavy weight underwear at the go-off for the present buying season, and yet only a comparatively few are getting business in excess of 30 per cent of what ought to be pouring into factories.

One of the southern mills which, like nearly all, got started late, has promise of selling its entire output of cotton ribbed garments—16 pound union suits and 11 pound shirts and drawers, and boys' garments as well. To date the mill's best single order is for 220 cases, and this from a jobber in New York, where depression may exist while there is activity in the West and other sections. Another jobber's purchases for the season aggregate 410 cases. The mill sells under its nationally known brands, and its prices represent a happy medium between the two extremes of high and low—basis of about $10.50 for the 16 pound suits, freight prepaid, but sold f. o. b. mill.

There has been a fairly good market also for suits selling to jobbers at and around $9 a dozen, but anything above that price is lagging somewhat until the $10 to $10.50 value is reached. Suits at $11 and up are not so active, either. Jobbers want a combination suit that retailers may sell at $1.50, and hold they cannot pay more than $10.50. Some will pay $11, and those who pay more contemplate a $1.75 retail garment. A similar suit, embodying more attention to nicety in detail, and sold direct from mill to retailer, will go over the counter at $2.

Holdbacks among the jobbers affect to believe there are accumulations of seconds of winter underwear which, they seem to fear may be dumped on the market late in the season, with disastrous results to distributors buying now. It is not denied there is some carryover stock, but it is not believed to be sufficient to compensate for the loss of production by reason of getting started four to five months late. If there were stocks of any moment it is not likely, in view of the experience of last year, mills with accumulations would be so busily engaged—that there would be a curtailment until the accumulations had been taken. It seems not improbable that by October winter underwear will be as scarce for immediate delivery as light weight garments now are; that the scramble of this spring will be repeated in the fall.

There has been a noteworthy adherence to prices of

winter underwear, in spite of the apathetic attitude of jobbers mainly. Since the break from schedules immediately following the ill-advised opening, there have been but few changes, and these of no great moment. This is attributed to the operations of the open price plan in effect with the organized manufacturers maintaining office in Utica, N. Y., as the Knit Goods Manufacturers of America.

Fleeced underwear seems to not be keeping pace with ribbed goods, and the estimate is made by a leading manufacturer that the trade has bought less than 35 per cent of what was contemplated when the mill got into operation. Even standard lines of fleeces were slow to make a move toward catching up. The situation is somewhat discouraging to manufacturers, who are confident, however, there will be a rush of late buyers. Yet they are reluctant to operate beyond the limit of safely estimated requirements. It is not believed either of the leading mills making fleeces will go strong on anticipated needs.

Sweaters showed a picking-up in April, but sagged during a great part of May, due to ultra-conservatism among jobbers operating for fall. Some mills already had sold sufficient to warrant the prediction part of their deliveries would be late, and jobbers were disposed to do some little buying right along, of women's and children's garments, sweaters for men constituting the weaker spot in the market. Then came the rains and cool days in late April and early May, and immediate delivery orders for spring fell off. The psychological effect was a drop in the business in fall goods, and about that time several mills came out with lower prices. Here was a combination of circumstances that make the strong jobber weak, and mills became more eager for business.

The price of a line of sweaters made from cotton and wool, for women, was reduced to $31.50 a dozen, although the garment is intended to sell at five dollars by retailers. It cannot be made and sold at any such figure, says a manufacturer who got out a line of samples and kept very close tabs on every item of cost. He anticipated selling at $36. When told he was $4.50 above the price of another mill he dropped to $33, but has not sold a dozen, and will not, for he says he positively will not operate at less than a three per cent margin over cost. The jobber buying at $31.50 sells the sweater to retailers at $42, taking down a profit of 36 per cent, and at five dollars a garment the retailer makes 43 per cent.

The knit goods factory that is getting more than a tithe of the per centum of profit that distributors are able to provide for themselves is in a class by itself.

The American Water Softener Company, Philadelphia, Pa., recently installed a six-foot diameter softener of the "DecAlso" type in the Kirk Laundry, Philadelphia, and have orders for a 60-inch softener for the Huguenot Laundry, New Rochelle, N. Y.; a 48-inch softener for the Tilley Laundry at South Orange, N. J.; and a 6-foot softener for Schwarzenbach Huber & Co., West Hoboken, N. J. All these plants are of the "DecAlso" type.

The Westinghouse Lamp Company has just issued the first edition of a new monthly house magazine, "Light Touches." This contains sixteen pages, and deals with the activities of the "A" and "B" agents of the company and its lighting, service and engineering activities.

Georgia Manufacturers Meet at Athens.

(*Continued from page* 595.)

I think it should be borne in mind that Mr. Slate is our representative, and we have the right to talk plainly to him. We are admirably situated here in Georgia as regards our labor, and any averages that might be obtained through the taking together of rates of other states in their claims, would not probably apply to Georgia. We seem to be a people down here in a favored condition in the class of labor that we have. I refer to colored labor. When they were injured under the old way of handling insurance, they looked for a return, and they stayed away from work for a week or ten days, accepted the pay, and in many instances they were paid. Under this law, they would not be paid unless they were away fourteen days or more. Therefore, the insurance companies are benefited to an exceeding degree on account of the lessened amount that they have to pay out for this class of labor and for medical attention. I am making these remarks because so many of these questions have come up to me in the last sixty days, and I wanted Mr. Slate to understand how we felt about it, and to what extent he can give us this adequate relief.

Mr. Slate:—I believe the manufacturers of the State are fair, and if you do not believe that your rates are fair, as your representative on that board, I will assemble and try my best to get statistics as they develop in your line of business and I will arrange to have that before the rating bureau, and go with you, if we have a case that will justify us in making a claim. As stated here once before, when a man goes to figure against insurance actuaries in the accident business, he had better be careful about his figures because those gentlemen are paid exceedingly large salaries to figure very well, and they do figure very well as any of you will admit who have ever figured with them.

A lady in the audience:—You want to reduce accidents. All manufacturers do. I am in welfare work. I was wondering if you could not get together and have the manufacturers see if there is not some way by which they can succeed in having less accidents. The insurance companies, I should think, would just as gladly pay money not to have people hurt as to have them hurt. Suppose a manufacturer reduced his accidents, say, twenty-five per cent by a bonus system, and the names of such manufacturers could be put through the papers in Georgia, would it not be a good advertisement to be spoken of as the place where there was so much care being taken in the things that go to prevent accidents? Would he not be a blue ribbon manufacturer?

Mr. Slate:—In my home town of Columbus the Bibb Manufacturing Company are attempting to hold what we call Accident Prevention Days at different mills by bringing the question of the prevention of accidents to the attention of employees. We are doing that now over the state as best we can. I find this is working very well in two states. Where a man has a group of manufacturing plants in a state, he might encourage a spirit of friendly rivalry between the different managers in those different establishments in holding down the number of accidents. The Maryland Commission says that has worked well in different states, but I want you gentlemen to realize that this act has only been in force since the 1st of March. With a limited force, and attempting to handle 950 accidents, we

have had our hands full. The greatest difficulty we have had has been in Atlanta. A considerable number of lawyers have advised against going into an agreement for settlement, and we have had to explain it to them, and we have had very little time to work out some of these schemes, however desirable they might be, and we must have time to do these things just as we have to have time to produce statistics that will be valuable to the State of Georgia.

R. C. Freeman:—All the suggestions we have had about safety appliances are good and will tend to reduce premiums. I believe the rate is going to obtain in Georgia based to some extent upon the number of accidents. If we have minor accidents, which can be relieved by first aid, I fear that some superintendents will look on them as accidents, report them as such and run the rate up. The insurance company is going to make its rate on what it costs to carry that insurance and the first aid cases will run that cost up.

Mr. Slate:—Our first aid in this State shows an average cost of $8.00. $3.00 is the minimum. I don't want to do the doctors any injustice, but when you put a $100 medical benefit in an accident, sometimes it produces an unnecessary amount of visits. I want the necessary amount there, and I don't want the unnecessary.

It might be of interest to this Association to know these facts. We have the reports of thirteen commissions taken and tabulated, and what part of every dollar spent for compensation, death benefits and total disability do you suppose is spent for medical treatment? Sixty-six cents. Out of every $100 spent, $66 has gone for medicine and medical treatment. It is the one stumbling block. You take the State of Connecticut, returning approximately $2,100,000 in compensation last year, and they paid the doctors $1,979,000.

R. C. Freeman:—Don't you presume a large part of that was in first aid?

Mr. Slate:—Yes sir.

The next speaker on the program was Frederick B. Gordon, of Columbus, Ga., who spoke on "The Question of Boys," making an able plea for a Greater Georgia Tech and urging the support of the manufacturers.

Dr. Maynard then spoke briefly in favor of a resolution tending to aid the development of Georgia's mineral products. He was followed by Harry Hodgson, of Athens, on "Education and Business," who urged that proper support be given the Greater Georgia Tech movement now, and later that similar support be given to the University of Georgia.

Then came the report of the Committee on Resolutions, and the following resolutions were offered and adopted:

That the Association lend its unqualified endorsement to the movement to urge upon the Bureau of Mines the necessity for the investigation of Georgia clays, with a view of making known their possible utilization in the manufacture of refractory products, and that the legislative body of the State realize the importance of establishing a permanent non-metallic station in Georgia for the testing and investigation of clays and like materials and lend the financial support of the State to this undertaking.

That the Association endorse and commend the campaigns for improvements of the University of Georgia and the Georgia School of Technology.

That the Association go on record as favoring the appropriation of adequate funds from the State Legislature for the proper maintenance of the higher institutions of learning in the State.

That the Association go on record as approving the Act establishing a system of industrial rehabilitation and that its members lend their assistance, so far as possible, to representatives of the State Board for Vocational Education in the proper placement of persons who have been retrained under this Act.

That the Association urge that Congress enact promptly the emergency tariff act now pending and that a permanent duty be incorporated in the permanent tariff act when drafted, protecting the agricultural, dairying, cotton seed oil and peanut industries by placing duty of 5 cents per pound on crude foreign oils, and 6 cents per pound on refined foreign oils, and 4 cents per pound on foreign oil producing materials.

That the thanks of the Association be extended to the speakers who addressed the convention and that the secretary be instructed to convey their appreciation to these speakers by letter.

A suitable resolution was also passed thanking the several hosts of the occasion for the splendid hospitality dispensed to the delegates.

The nominating committee recommended the re-election of the entire list of offices and directors whose terms were expiring. This was done unanimously.

Final adjournment was then taken, and at 1:30 p. m. the delegates were taken in special cars to the State College of Agriculture for a luncheon which was served by the young ladies of that institution. There they were addressed by Dr. A. M. Soule, the president of the college, after which they were the guests at a ball game between the University of Georgia and the Alabama University.

The Anchor Post Iron Works, executive offices, Garford, N. J., have issued Catalog No. 56, which is descriptive of their line of fences for all purposes. The catalog is well illustrated, has an attractive cover design and contains 36 pages. It was prepared in conformity with the dimensions given by the American Institute of Architects—8½ by 11 inches—and contains, on pages 4 and 5, an illustrated index, which makes it very suitable as a reference book. Among the types described and illustrated in this catalog are lawn fences, high protective fences, tennis-court enclosures, farm fences and gates, poultry enclosures and gates, unclimbable factory fences, electric weld factory gates, and electric weld railing and gates.

A factory manager should have before him detailed cost reports showing the expenditures necessary to produce articles. With this information at hand, he is in a position to note the variables and put into operation the movements necessary for their satisfactory control. In this respect, the cost system is similar to the nerve system of the body, its function being to transmit information regarding conditions in the entire plant to some central individual or body.

The Lunkenheimer Co., Cincinnati, O., have just issued a booklet descriptive of "Ferrenewo" valves manufactured by them, showing different types of this valve, their sizes, prices, etc. It is also announced that the Chicago branch store of the Lunkenheimer Company moved from 188 North Dearborn Street to 568 West Washington Boulevard, effective May 1.

The Yarn Market.

There seemed to be somewhat of a steadying of rates in the list on the Philadelphia yarn market during the past four or five weeks, spinners being apparently unwilling to grant price concessions. This period saw a little revival in southern combed yarns, while carded yarns of the same section seemed hindered from advancement by surplus stocks which were evidently hard to reduce. In general, however, it appeared that there were plenty of yarns to be had, of all counts, and that all sales made were taken from stocks.

During the entire month of April, there was very little price fluctuation, and investigation at the end of this period showed that yarn prices had held firm and steady for the longest period of time in nearly a year. With only a few exceptions, southern carded yarns, for example, showed only fractional fluctuations in that period. In southern carded skeins and warps, both single and two-ply, there were no price changes in counts up to and including 14s.

During the last month, also, it was apparent that northern combed yarns were facing stiff competition from southern offerings of the same character. The Philadelphia dealers say that southern combed yarns were getting considerable business in the East, among mills using southern yarns for the first time; and that they are getting better prices, but that they are able to easily undersell similar grades of northern spun combed yarns. The explanation of this is that yarn spinners in southern mills have under gone a much more drastic reduction than eastern mills have found it possible to put into effect among their employees.

Prices on combed yarns generally advanced to slightly higher levels during the month, and the tire trade was evidently making great progress, work being resumed in many mills on tire yarn orders which had been suspended for months. This increase in combed yarns has placed the combed yarn spinners in a little more independent attitude.

Quotations on electrical yarns furnished by H. M. Remington, 113 Chestnut Street, Philadelphia, under date of May 9, follow:

60s	$1.45	80s	$1.55
100s	1.76	120s	2.35
140s	2.80	160s	3.40
180s	4.80	200s	5.50

Recent yarn quotations on the Philadelphia market follow:

Southern Single Skeins.

4s to 8s	20½	10s	21 @21½
12s	21½ @22	14s	22 @22½
16s	22½ @23½	20s	23½ @24
24s	24½ @25	26s	25 @25½
30s	26 @27½		

Southern Single Warps.

8s	20½ @21	10s	21 @21½
12s	21½ @22	14s	22 @22½
16s	22½ @23	20s	23½ @24
26s	25½ @26	30s	26½ @27
40s	36 @38		

Carpet and Upholstery Yarns in Skeins.

8s and 9s 3-4 slack	21½ @22
8-3-4 tinged tubes	15 @16
8-3-4 hard white warp twist	20 @21
8-3-4 hard twist waste	14½ @15½

Southern Two-Ply Skeins.

8s	20½	10s	21½ @22
12s	22 @22½	14s	22½
16s	22 @23½	20s	23 @24½
24s	24½ @26	26s	25 @27
30s	26 @28	40s	35 @41

Southern Two-Ply Warps.

8s	21	10s	22 @22½
12s	22½ @23	14s	22½ @23
16s	22½ @23½	20s	23½ @24½
24s	25 @26	26s	25½ @27
30s	27 @28	40s	37 @41

Southern Two-Ply Combed Peeler Skeins and Warps.

20s	44	24s	46
30s	48 @50	40s	57 @58
50s	62½ @65	60s	70 @75
70s	82½ @85	80s	95

Southern Frame Spun Carded Yarn on Cones.

8s	21 @21½	10s	22 @22½
12s	22½ @23	14s	23 @23½
16s	23½ @24	18s	23½ @24
20s	23½ @24½	22s	23½ @24½
24s	24 @25½	26s	24½ @26½
30s	27 @29	40s	38 @40
30s double carded	31 @33	30s tying-in	25 @26½

Northern Mule Spun Carded Yarn Cones.

10s	26	12s	27
14s	28	16s	29
18s	30	20s	31
24s	33	26s	34
30s	36	40s	43

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	35	12s	36
14s	37	16s	38
18s	39	20s	40 @42
22s	42 @43	26s	45 @47
28s	48 @49	30s	50 @51
36s	57 @58	38s	59 @61
40s	60 @63		

A New Booklet.

Assistance that is both practical and expert in the use of American dyes is contained in the "Manual of Hosiery and Knit Goods Dyeing," recently issued by the National Aniline & Chemical Co., Inc. This new publication marks the latest development in what the company terms "National Service."

In the booklet are described processes for the application of sulphur, direct, chrome, diazotized and developed dyes. As the preface states it "is prepared for the purpose of supplying the dyers of hosiery, knit goods, sweaters, and allied fabrics with technical information relative to the application of 'National' dyes.'"

It is not intended as a text book on dyeing but simply as a practical working guide for the foreman dyer and his assistants in the routine of their daily work.

Its twelve chapters treat, in part, of novel and unusual aspects of the business, such as monotone effects, dyeing of heather effects, dyeing of tricolette, mercerized cotton and artificial silk hose.

Special attention has been given to the selection of receipts which have been thoroughly tried out, both in the laboratory and on a commercial scale in the dyehouse. A copy will be sent on application to the main office of the National Aniline & Chemical Co., Inc., or to any of its branch offices.

The Carlyle Johnson Machine Co., Manchester, Conn., are issuing a stock list showing a comprehensive assortment of sizes in which the standard sizes of the Johnson friction clutch can be obtained immediately from stock, showing the bore, hub diameter and length, size number, and also the quantity in which they are obtainable. This is in line with a program which the company has been working out in the past few months, and they have approximated the conditions under which they are able to supply their standard slow speed clutches, in either a single or double type for any dimensions of pulley or shaft. A similar program is likewise in progress on the high speed clutches, and they expect to soon be able to extend this service on clutches of the high speed type. They also issue a stock on additional special sizes which are not commonly in demand, and the number which are available at the time the list was printed.

In attempting to control production it is important to know what a plant is capable of producing at each work station and in each department. The capacity in hours of work should be known for all production centers and for the plant as a whole.

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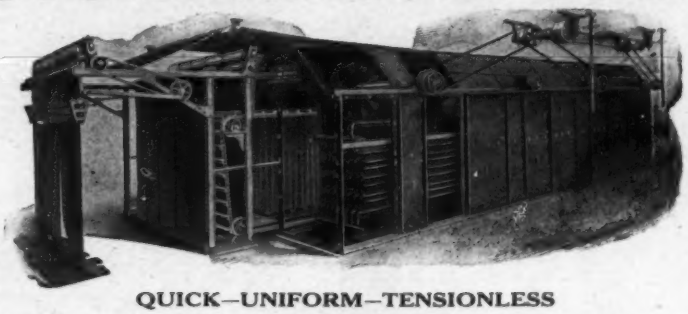

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For any fabric which can be hung up during the drying, this system is an ideal method. It offers a perfect, natural, tensionless system of drying at moderate temperatures, which closely approaches nature's own way of drying. In addition, it makes possible a shortening of the drying time and savings in the labor of handling the material, not possible by any other means.

The cost of drying is reduced because of low power and steam required.

Write for Illustrated Catalogs.

For tubular knit fabrics our patented opening and spreading device eliminates the twist and opens out the cloth so that it is delivered from the machine smooth and with the wale straight.

For shrinking cloth this system is unsurpassed, as it gives maximum shrinkage in the shortest possible time, and at the same time preserves the quality of the cloth.

A "Hurricane" Dryer for Every Material.

The Philadelphia Drying Machinery Company

Southern Representative
G. G. Slaughter Machinery Company
Greenville, S. C.

Stokley Street above Westmoreland
Philadelphia, Pa.

Boston Office
53 State Street

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

...niversal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks.
Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.

99 Beekman Street NEW YORK

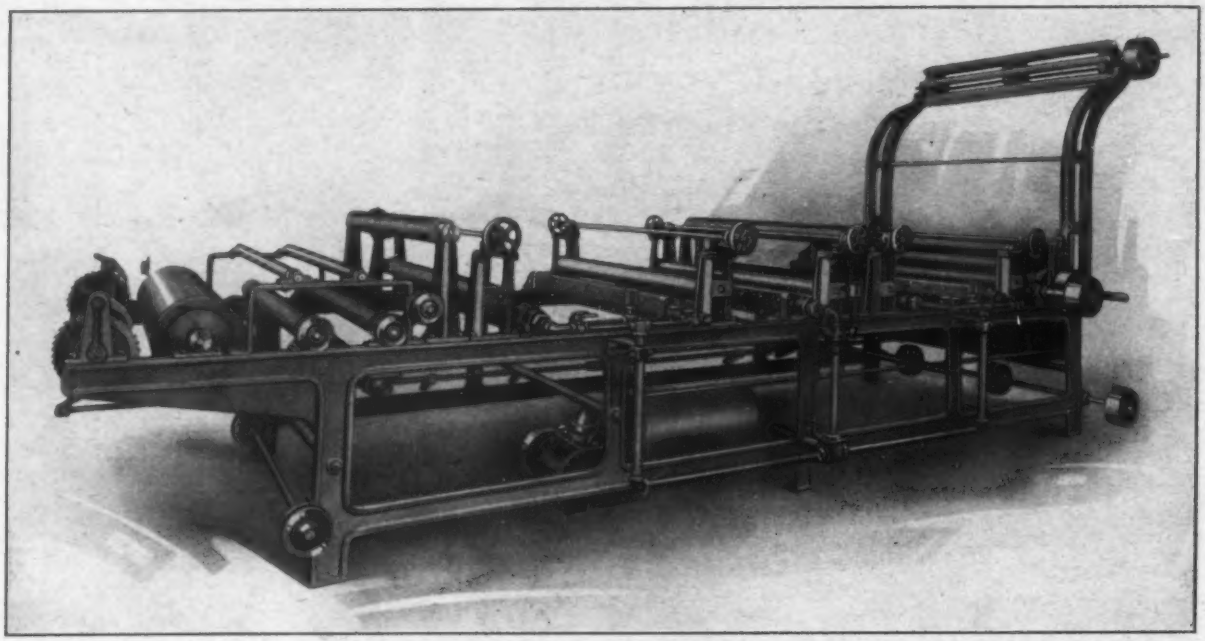
The Walke Box Company, Inc.

NORFOLK, VA.

Manufacturers of

NORTH CAROLINA PINE BOX SHOOKS

FINISHING
Butterworth
MACHINERY



Singeing Machine—Gas Fire Burners

Butterworth Finishing Machinery represents more than a century's experience in manufacturing finishing machinery. It reflects as well a century's study of the finishing needs of the textile industry and how they can best be met.

THE BUTTERWORTH LINE INCLUDES:

Ageing Machines
Bleaching Machines
Drying Machines
Singeing Machines
Mercerizing Ranges
Hydraulic Presses
Dyeing Machines
Soaping Machines
Tentering Machines
Mangles (all kinds)
Calenders (all kinds)
Color Kettles
Cell Dryers

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

PROVIDENCE OFFICE
Turk's Head Building

Canadian Representative
W. J. WESTAWAY COMPANY
Hamilton, Ontario, Canada

"HUMANEERING"

Essentially an "American" Idea

Conceived and developed by American efficiency engineers, The American Mill Village Laundry is essentially an "American" idea.

It represents a new and important development in that branch of industrial engineering which an executive has aptly styled "Humaneering."

It is a phase of industrial management which recognizes the human element, by far the most important factor in modern production.

The American Mill Village Laundry is first of all a complete, thoroughly equipped laundry plant.

It is designed and installed by American engineers, manned by a competent staff of expert operators carefully trained by American demonstrators.

And when it is completed and turned over to the mill management an American Mill Village Laundry is prepared to relieve all of the housewives of the village of the burden of home-washing—prepared to free the mill from the drain of washday lay-offs, and to end Monday and Tuesday slack production periods.

And, while doing this at a profit to the company and a saving to the employees, it at the same time brings into the homes of mill workers a more typically American standard of living; more sanitary surroundings; a wholesome pride which makes for a higher type of citizenship. Employees of this class mean a great deal to twentieth century industry—they mean greater production, a finer craftsmanship —a more permanent tenure.

These results are worth while. We will gladly show you, without obligating you in the least, how you can obtain them in your mill.

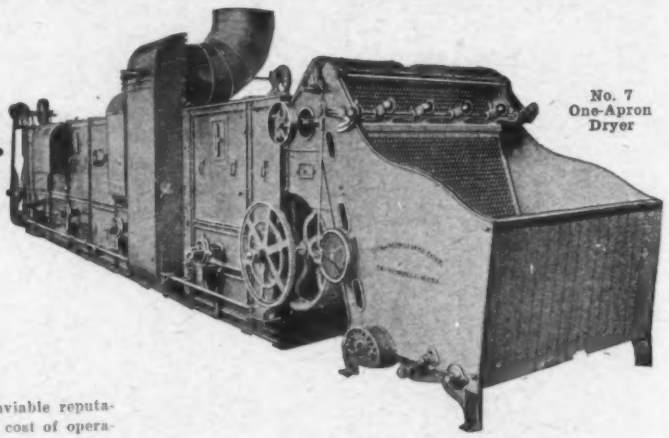
A letter today will secure for you the expert counsel of American engineers who know.

The American Laundry Machinery Company

Specialty Department C, Cincinnati, Ohio

This composite factory group shows the manufacturing plant of the American Laundry Machinery Company, the world's largest producer of laundry equipment, and originator of the American Mill Village Laundry. The service of this organization is sold with every American Mill Village Laundry installation.

More and Better Drying At Lower Cost



No. 7 One-Apron Dryer

For over 35 years SARGENT Stock Dryers have held an enviable reputation for perfect drying and maximum production at the lowest cost of operation and upkeep. Years of study and development have brought out principles that have been so combined and adapted as to make dryers that are unexcelled and that have the widespread approval of expert drying engineers.

SARGENT Dryers are built in several standard sizes and in various combinations and special designs. Let us specify the type best suited to your particular conditions. Perfect satisfaction and economic results will be assured you.

Our Southern representative will be glad to confer with you and give every assistance possible in solving your drying problem.

A few of the hundreds of mills which prefer SARGENT Dryers.

Amoskeag Mfg. Co.	Deep River Mills.
Indian Orchard Co.	Eno Mills.
Massasoit Mfg. Co.	Gibson Mfg. Co.
Johnson & Johnson.	Stark Mills, Etc.,
Nashua Mfg. Co.	Etc.

C. G. SARGENT'S SONS CORP., Graniteville, Mass.
Fred H. White, Southern Agent, Charlotte, N. C.

SARGENT DRYERS

NORWOOD

Mechanical Filtration

Gravity or Pressure Types

Clean, Clear Water Guaranteed

NORWOOD ENGINEERING CO.
FLORENCE, MASS., U. S. A.

Chas. M. Setzer, Southern Representative
Charlotte, N. C.

TEST COLOR FASTNESS BY RADIATION METHOD

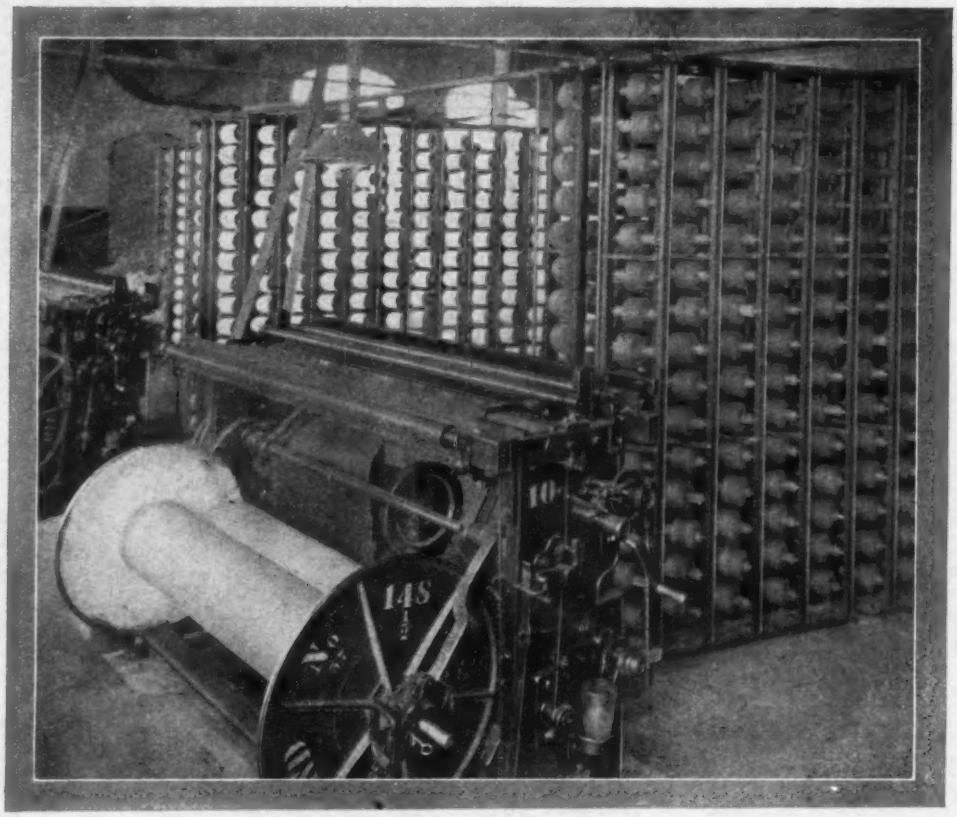
The need for a basic standard brought the perfecting of this method of determining fastness to light of colors and dyestuffs.

The FADE-OMETER was designed solely to fill a need for a standardized light equal in intensity to sunlight and available at any period of the year.

Elimination of the old time sun testing method has brought about a revolution of vast import to the textile manufacturer who using the Fade-ometer standard, reproducible tests can now be made in a few hours.

Unequaled for comparative service. Write us for fuller information in regard to this instrument.

ATLAS
ELECTRIC DEVICES COMPANY
360 W. Superior Street
CHICAGO, ILLINOIS



Franklin Packages in V Creel.

New Business for White Goods Manufacturers

The problem in the textile trade as in most other trades today is to get any kind of business to keep the mill going. On the other hand it is hardly a time to accept business which will necessitate new equipment or any extensive changes in manufacturing methods.

White Goods Mills Can Produce Colored Shirtings, Voiles, or Dress Goods without Buying Extra Equipment

THE FRANKLIN PROCESS enables them to shift from white goods to colored goods and vice versa in one day's time and without extra cost. In other words by using yarn dyed by the Franklin Process Company a white goods manufacturer can make carded or combed yarn shirtings without adding to his present equipment and without hiring new labor.

It is Done in This Way:

The manufacturer ships yarn to the Franklin Process Company on spinning bobbins, cones or parallel tubes. The Franklin Process Company winds the yarn on its parallel dyeing tubes, dyes it and returns it to the customer ready for use in the V creel for warping.

The Manufacturer Eliminates the Expensive Operation of Beaming Dyed Warps

Some manufacturers report that by using yarn dyed by the Franklin Process Company they make a saving of from 8c to 10c per pound over the cost of handling dyed chain warps.

Making colored goods from Franklin dyed packages is just like plain weaving. Franklin dyeing for colored goods is not an experiment. The Franklin Process has been used by some of the largest colored goods manufacturers in the country, using both plain and fancy looms.

Let us send a man to explain more in detail our proposition. It will cost you nothing and it may be the means of increasing your business.

FRANKLIN PROCESS

Philadelphia CO. Manchester, Eng.

PROVIDENCE, R. I., U. S. A.

Job Dye Houses in All Three Cities.

"We Sure Are Saving Soaps, Dyes & Chemicals"

Since we installed that "DECALSO" Zero Water Softener we've cut our consumption of soaps, alkali and dyestuffs at least a third and perhaps a half, not to speak of less redyeing, less spoilage, less labor and a more uniform, higher grade product.

"DECALSO" Water Softeners are paying big dividends in many mills. It has proved itself the most efficient and dependable apparatus for producing absoultely pure, soft water quickly, continually and economically.

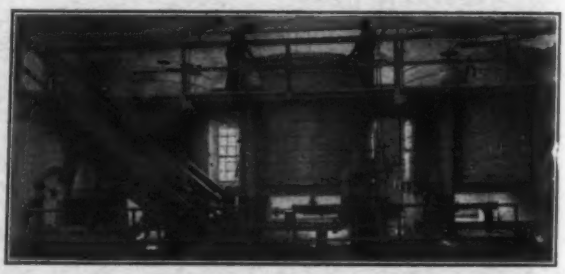
For whatever the purpose you need soft water, there's a "DECALSO" Apparatus to meet your requirements better than anything else. Our experts are at your service, and will gladly solve your water problems without obligation. Write today for booklet.

American Water Softener Co.

The Oldest Water Softener Manufacturers in America

Lehigh Ave. at Fourth St.
Philadelphia, Pa.

REG. U. S. PATENT OFFICE
DECALSO



COCKER HOSIERY DYEING MACHINE

THIS machine has been thoroughly tested out with all colors and under all conditions, and is guaranteed to give the very best results possible in the dyeing of hosiery.

The stock is carried in four perforated metal containers equipped with one removable head on each container, and the containers mounted on Spiders in such a manner as to permit of their being loaded and unloaded quickly from the machine.

The Spiders carrying these containers are revolved in the vat *in one direction*.

Machines are furnished with either belt or motor drive.

Points of Advantage in This Machine That Must Be Considered

1st—Matting and chafing of the stock is entirely eliminated.

2nd—Percentage of re-dyes is reduced to a minimum.

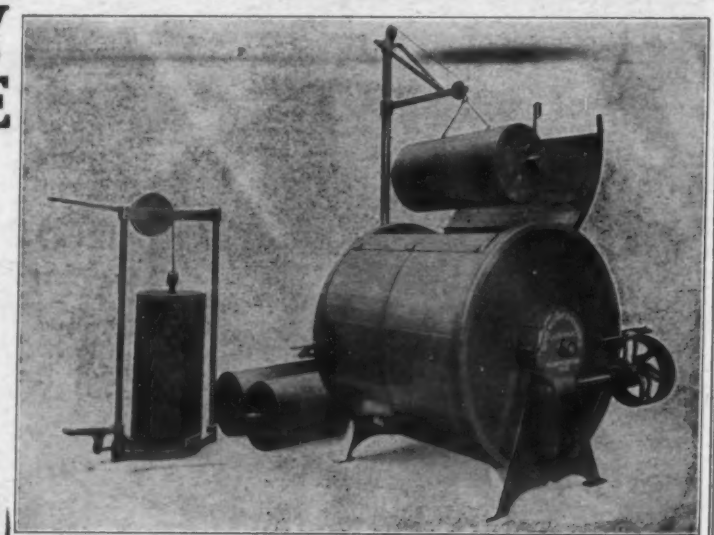
3rd—Different sizes and descriptions can be handled in one dyeing without confusion.

4th—Time required for loading and unloading machine reduced to a minimum.

5th—Absolutely level dyeings on all colors.

6th—Minimum of power required for operation.

For further particulars and prices write or wire.



Cocker Machine & Foundry Co.

GASTONIA, N. C.

Builders of Textile Machinery.
Warpers—Beamers—Balling Attachments—Warp Dyeing Machinery—Reels

TOLHURST EXTRACTORS

are pre-eminent in High Speed Production

Here is an illustration of their usefulness in the Textile field. It represents two 48″ engine driven Tolhurst "Self-Balancing" Extractors whizzing piece goods after dyeing. This plant, a well-known silk-dyeing factory, has sent us seven repeat orders—a definite proof of satisfactory service.

If you are interested in high-speed production, where hydro-extraction plays or should play a part, send for particulars.

Tolhurst "Self-Balancing" Extractors are constructed with baskets 12″ to 72″ in diameter and are arranged for motor, countershaft or engine drive from above or below.

TOLHURST MACHINE WORKS

Established 1852 **TROY, NEW YORK**

New York Office, 111 Broadway

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San Francisco, Cal.

Canadian Rep.:
W. J. Westaway Co.
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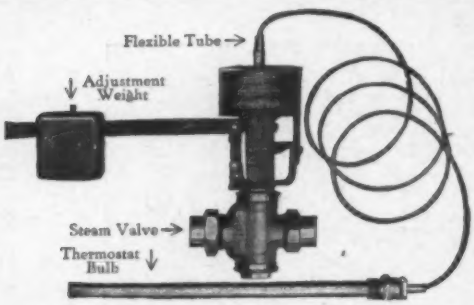


Powers Regulator No. 11

For Liquid Temperature Control

Especially adapted to control of dye baths, assuring colors without variation or streaks; wool washers, preventing loss from discolored, harsh, or tender wool; also size boxes, preventing broken ends and chafing, by keeping size at even temperature, avoiding boiling over or cooling off; hot water tanks; and practically any process where liquid is to be maintained at an even temperature.

Entirely automatic. Reliable. Accurate. Easily applied; put thermostat bulb in liquid to be controlled and valve in steam supply. Regularly fitted with 6 feet of flexible tubing. Longer tube if ordered.

Powers Regulators Save the Product

In scouring, rinsing, and washing, automatic regulation of temperature prevents harsh or tender wool.

In sizing, even weight and strength are assured by automatic control of the size box. The liquid cannot boil over and the expense of broken ends and chafing is greatly reduced.

Maximum Efficiency in Dyeing Demands *Exact* Temperature Control

An unvarying temperature in the Dye Bath is of the utmost importance. Variations in temperature result in "seconds," off shades and streaked places, which mean serious loss. Satisfaction can be obtained only by keeping the liquid at the exact and proper temperature.

The Powers Thermostatic Regulator

automatically controls the temperature of the liquid. It eliminates the possibility of error that is always present with manual control. A simple adjustment sets it for the desired temperature and requires no further attention. The sensitive thermostat regulates the heat to the proper degree.

The Powers Regulator Company

Chicago, New York, Toronto Boston

SPECIALISTS IN AUTOMATIC HEAT CONTROL

Southern Representatives. "ASKUS" Ira L. Griffin, Greenville, S. C. Guy L. Morrison, Charlotte, N. C.

(1449-B)

Soft Water Saved 25% of Dyestuffs for this Hosiery Mill

This mill manufactures a well known brand of hosiery in cotton, wool and silk. These are bought in the yarn which is knitted, bleached, dyed and completely finished for the market. Their equipment is modern, they use the most up-to-date methods, but the water supply contains an average of 18 grains of hardness per gallon.

Due to this hardness, many manufacturing difficulties were encountered in producing goods of first quality, so in 1919 they installed Permutit Water Softening Equipment to extract all hardness from the water supply, delivering it clear and zero soft to the mill.

The effect was immediately apparent.

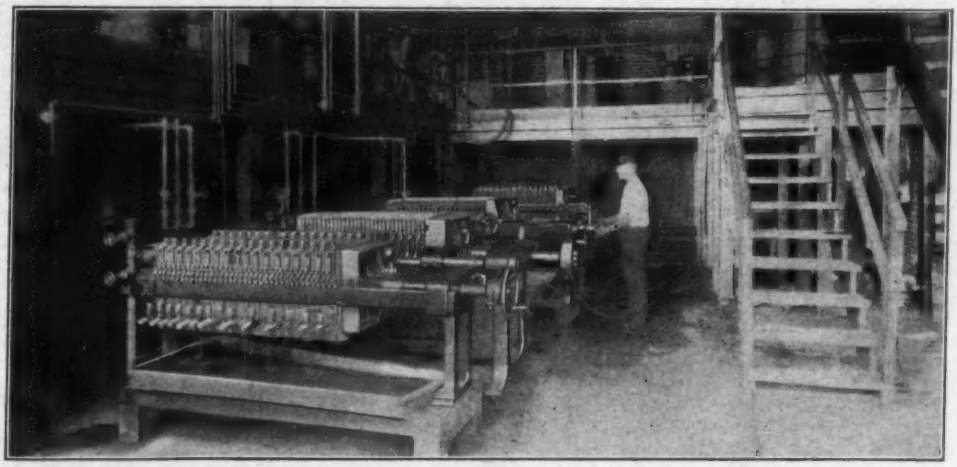
Bleaching became dependable, and the dyed hosiery not only showed vast improvements in quality but a valuable saving of dyestuffs was effected. A 40-dozen lot of hose, for example, dyed a certain number "brown," that averaged 63 ounces of dyestuff with the raw, hard water supply used only 47 ounces with Permutit softened water. Improvements in shades, strength and brilliance of color were noted, but most important of all, the uniformity of the soft water supply permitted dyeing formulas that would consistently match shades. Redyeing and boiling down wastes were practically eliminated.

It pays to treat your water supply—it pays to invest in Permutit Equipment. Let us send you, free of charge, our booklet "Permutit in the Textile Industry." Write today.

This booklet contains valuable information that every operator should have. Sent free, postpaid, upon request.

The Permutit Company
440 Fourth Ave. New York

Filters — Water Softeners — Special Apparatus



Under this one roof—a score of miniature dye plants are producing American Dyes.

Sulphogene Carbon H. Conc.

Since the introduction of this product a few weeks ago, it has set a new standard for Sulphur Blacks because of its strength and perfect solubility—making it a most economical product. Its richness of shade makes it a close rival of Aniline Blacks

After the evolution of any particular dye in the research laboratory, it is sent to the Semi-Works—a collection of miniature dye-making plants complete in every detail—where the best practical method of manufacture is carefully and painstakingly evolved. The right sort of machinery is worked out on a small scale, it being frequently necessary to scrap the entire plant several times before the correct sequence of steps, together with the requisite equipment, is discovered—to produce the maximum yield of the highest quality of the dye.

Then and then only, after every detail is as right as human ingenuity can make it, a plant is built to full scale for the production of this particular dye, on a commercial basis.

If this method and details were not first developed in the Semi-Works, the prices of dyes might easily be many times greater than they actually are.

The construction of several Semi-Works at our Deepwater Plant is a guarantee that an adequate supply of Du Pont Dyestuffs in an ever-increasing volume will be available to the dye consuming trades.

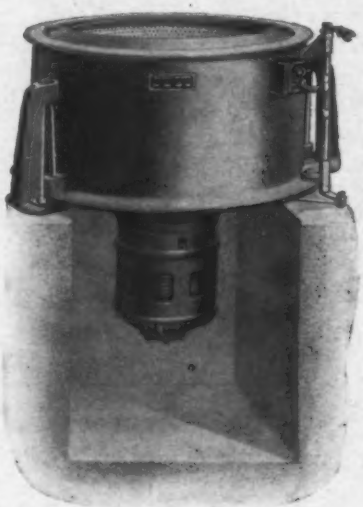
This is a view of one of the Semi-Works Plants

E. I. du Pont de Nemours & Co., Inc.
DYESTUFFS DEPARTMENT
WILMINGTON, DEL.

DU PONT DYESTUFFS

FLETCHER WORKS

ELECTRIC UNDERDRIVEN HYDRO EXTRACTORS



The Extractor with One Moving Part.

Built with 42", 48" and 60" Baskets

NOW is the time to equip your plant with the most modern and effective Centrifugal Extractor of its type on the market today. Perfection of motor construction marks a further step forward of this widely known extractor—equally adapted for piece goods, silk, hosiery or yarns—and the demand has kept pace with our ability to make deliveries.

Rotor mounted on basket shaft
No centrifugal clutches or couplings
No belts to endanger operator
Push button control and interlocking brake
Oversized ball bearings give operating economy
No complicated mechanism to get out of order
Induction motor prevents excessive speed
Basket accessible all around

For more than a half-century this house has been building centrifugal extractors of the highest grade, and has been foremost in developing machines which will stand the wear and tear of every-day use. That is why you will find Fletcher Works—(Schaum & Uhlinger)—"whizzers" which have been working year after year for decades—we can say generations in many instances.

We Build for Service—and on Proved Mechanical Precepts

FLETCHER WORKS

Glenwood Ave. at Second St., Philadelphia, U. S. A.

REPRESENTATIVES:

R. R. Street & Company
28 N. Clinton Street
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Thomas B. Whitted
Realty Building
Charlotte, N. C.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON

DYEING - BLEACHING-SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W Machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the **"world's best dyeing, bleaching and finishing machinery."**

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

DRYING

TEXTILES of every description are dried most satisfactorily and economically by "Proctor" Dryers.

Significant of their superiority, is the fact that there are more "Proctor" Dryers used in textile mills than any other kind of drying equipment.

Built in various types, sizes and capacities for drying textile raw stocks, yarns, fabrics, and products—each has a proven record of drying best the material for which it is adapted—with the utmost efficiency and economy.
Write for a catalogue on the "Proctor" Dryer suited to your need.

PROCTOR & SCHWARTZ, INC.
(Formerly.) The Philadelphia Textile Machinery Co.
PHILADELPHIA

"Proctor" DRYERS

QUALITY is our watchword. Just as the eagle reigns supreme in its class, so Mathieson "Eagle-Thistle Brand" Chemicals are noted for their supreme quality.

Living up to our reputation is a responsibility which we never shirk, for our friends have placed their confidence in Mathieson superiority and we cannot afford to injure this reputation by letting any product leave our plant that does not come up to Mathieson high standards.

All Mathieson Chemicals are manufactured exclusively by us in our two plants. Throughout the process of manufacture, step by step, Mathieson products are tested for purity and uniformity. Every ounce must come up to Mathieson quality before it is passed.

LIQUID CHLORINE, 100% pure, anhydrous—BLEACHING POWDER, the highest test manufactured—SODA ASH, 58%, both light and dense shipped in bulk, in bags and barrels—CAUSTIC SODA, 60, 70, 74, 76 and 78 percent grades. The electrolytic 78% grade, analyzing 99.7% hydrate of soda, is the purest caustic known—VIRGINIA SODA (Sesquicarbonate of Soda), a beautiful white crystalline neutral soda, uniform in character and action—BICARBONATE OF SODA (U. S. P.) and CHLORINE SOLVENTS.

Shipment is made from one of our stocks located at convenient points throughout the South, insuring you quicker delivery and lower freight charges.

We will be glad to send a man to your plant to demonstrate any Mathieson product and prove to you its superiority. You can never go wrong on a Mathieson product.

Write, wire or phone our Southern Office.

THE MATHIESON ALKALI WORKS, Inc.

Executive Offices: 25 West 43rd St., New York City
WORKS: Saltville, Va., and Niagara Falls, N. Y.
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CIBA COMPANY, INC.

CEDAR AND WASHINGTON STREETS, NEW YORK

Sole representatives in the United States of the
SOCIETY OF CHEMICAL INDUSTRY IN BASLE, SWITZERLAND

Special attention is called to the

DOW SYNTHETIC INDIGO
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SELLING AGENTS FOR
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BRANCHES:
BOSTON PROVIDENCE PHILADELPHIA CHICAGO COLUMBUS, GA.

Stauss 68% Soluble Tallow and Gum—Soluble Oils

for all warp sizing and finishing purposes.
None better.
Manufactured by Geo. P. Stauss.

Importers and Distributors of
Starches, Softeners, Weighting Compounds

Write, phone or wire

Southern Distributing Company
Manuel Faulkner, Sales Mgr.
50 Market St., Phone 3439 Charleston, S. C.

Reducing Production Costs

When searching for ways of reducing the cost of production consider the Autogyp Process.

Instead of bleaching Cotton and Cotton Goods preliminary to dyeing you can use the AUTOGYP Process which simultaneously dyes to shade and eliminates specks, leaf and shives.

The enormous savings of such a method are obvious to every practical Millman. Here are a few of them: Saves 50% in time over the former one-kettle process (80% where the overnight Kier-boiling method is used), eliminating 6 separate operations; 3½% of shrinkage; 50% of steam; 30% of labor; ALL chemicals used in the chloride of lime method of bleaching, and turns out a dyed fabric which is just as clean and considerably softer to the feel. These figures are not guesses, but results from actual tests carefully made.

If such economies interest you let us prove them by actual demonstration with your own goods, your own equipment in your own plant at our expense. A letter from you will bring full details.

SURPASS CHEMICAL CO., Inc., ALBANY, N. Y.

AUTO GYP
Process of Dyeing

Improve Your Blacks

"Developene"

Turns a *Rusty Black* to a *Lustrous One.*

THERE is no slight of hand connected with it. Send a pair of stockings, a skein of yarn or a sample of fabric, which has been dyed black, washed but not finished, to our Laboratory.

We will finish it with "Developene" and return to you. There will be such an improvement you will want "Developene" for your dye house right away.

MANUFACTURED ONLY BY

KALI MANUFACTURING CO.

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MANUFACTURING CHEMISTS

PHILADELPHIA, PA.

Salicylic Acid Prevents Fermentation of Size.
Sole Manufacturers of Hydroxy Oils and

Kali Chlorine Neutralizer--The Superior Anti-Chlor.
Formaldehyde

ESTABLISHED 1815

ARNOLD, HOFFMAN CO., Inc.

PROVIDENCE, R. I.
BOSTON, MASS.

NEW YORK, N. Y.
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CHARLOTTE, N. C.

Importers and Manufacturers of

STARCHES, GUMS, DEXTRINE, ALIZARINE ASSISTANT, SOLUBLE OIL, SOAP

And Every Known Material from Every Part of the World for Starching, Softening, Weighting and Finishing Yarn, Thread or any Fabric.

Special Attention Given by Practical Men to Specialties for

SIZING, SOFTENING, FINISHING AND WEIGHTING

Cotton, Woolen and Worsted Fabrics combining the latest European and American Methods.

We believe there is No Problem in

SIZING OR FINISHING

That We Cannot Solve.

FORMULAS for the best method of obtaining any DESIRED FINISH on any fabric cheerfully given.

Community Laundries

Do you operate a community laundry or possibly it is only a laundry for your waste and wiping rags.

In either instance your objective is a sanitary wash and at a small cost well within reason. Such results are easily attained by the use of

"Wyandotte" Yellow Hoop

For twenty-one years we have specialized in the manufacture of washing agents and for a similar period Wyandotte Yellow Hoop has been used by the laundries. Today it is the universally recognized standard supply by the power laundries. May we tell you more about it?

THE J. B. FORD CO. Sole Mfrs.

WYANDOTTE, MICH.

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Manufacturers and Importers

Castor Oil and Castor Oil Products

Turkey Red Oil	Soluble Grease
Alizarine Assistant	Soluble Wax
Castor Soap Oil	Soluble Rosin
Bleaching Oil	Olo Soffene
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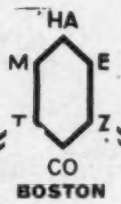
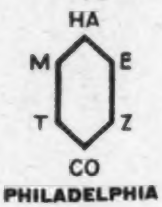
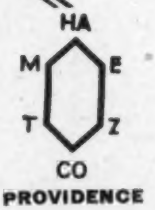
Victroline	T. R. Soap
Soluble Oil	Oleine

Flaxhorn—The Delicate Finish.

Works and Office: ATLANTIC, MASS.







PRESIDENT HARDING SAYS:

"WE WANT less Government in business and more business in Government."

Licensing continues "Government in Business."

As a consumer of dyes, the question of licensing imports affects you materially.

It is up to the consumer to decide for himself.

Now is the time to make your position clear to your Representatives and Senators.

Aside from the line of Dyestuffs, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble Oils and Leather Oils made in the U. S. by

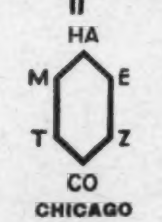
CONSOLIDATED COLOR & CHEMICAL CO.

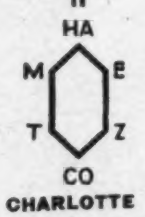
and

CENTRAL DYESTUFF & CHEMICAL CO.

We can also procure for you vat and other colors on licenses at lowest prices quoted for export by the European manufacturers.

A new color card of American made colors on cotton yarn is being distributed. Have you received your copy?

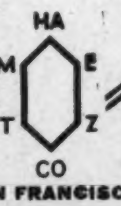




H. A. METZ & CO. Inc.

One-Twenty-Two Hudson Street, New York City.

Boston Philadelphia Providence Chicago Charlotte San Francisco



The Grasselli Chemical Co.

DYESTUFF DEPARTMENT

Works at:

GRASSELLI, N. J. ALBANY, N. Y.

SULPHUR COLORS: Black, Blue, Brown, Green.
Direct Cotton Colors, Acid and Chrome Colors
MONOPOLE BRILLIANT OIL
Bichromate of Soda Sodium Sulphide
Zinc Dust, Chemicals and Acids

BRANCH OFFICES:

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Boston	Chicago	Cleveland	Cincinnati	Providence
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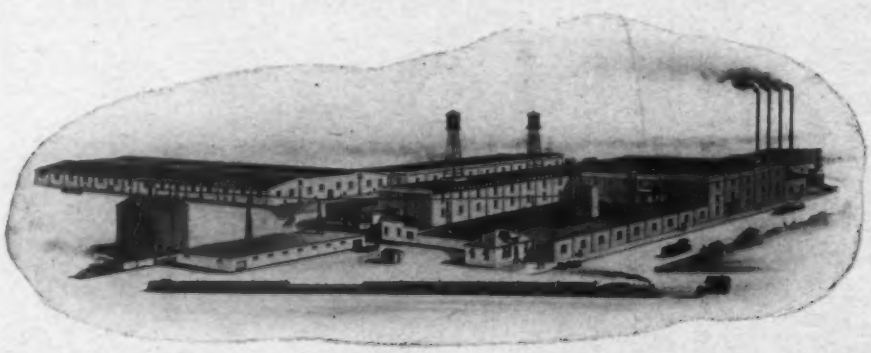
The Grasselli Chemical Company, Limited

Toronto Hamilton Montreal

Sole Selling Agents for Essex Aniline Works, Inc., Boston, Mass.



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

ZAVON

The Super Solvent

Will increase your business by improving the quality of goods produced in your mill. ZAVON excels all other solvents BECAUSE:

1st. It creates an affinity for the dye thus producing even, rich effects.

2nd. It replaces soap in the kier, affecting a marked saving in operating costs.

3rd. It removes all stains from knit goods and hosiery.

4th. It greatly reduces the amount of "seconds" in hosiery mills.

ZAVON will be found to be a superior softener for penetration.

For mills using silk and cotton mixture ZAVON can be used both as a softening and cleaning agent.

We are in a position to handle all orders promptly and are always pleased to send working samples upon request.

ZAVON COMPANY

INCORPORATED

Bush Terminal, Bldg., No. 1 *Brooklyn, N. Y.*

American Yarn and Processing Company

MOUNT HOLLY, N.C.

Successors to

AMERICAN PROCESSING CO.
ADRIAN MANUFACTURING CO.
ALSACE MANUFACTURING CO.
NIMS MANUFACTURING CO.
UNION COTTON MILLS
WOODLAWN MANUFACTURING CO.

Spinners and Mercerizers of

HIGH GRADE COMBED AND CARDED YARN

16s to 80s SINGLE AND PLY

WARPS, SKEINS, TUBES AND CONES

MERCERIZING
BLEACHING
GASSING

IN A NEW AND STRICTLY MODERN PLANT

HIGHEST QUALITY PROCESSED YARN

We are located in the center of the combed yarn spinning industry of the South and are enabled to furnish you with highest quality processed yarns in all numbers.

NEW YORK REPRESENTATIVE:
H. B. ROBIE, 346 Broadway.

PHILADELPHIA REPRESENTATIVE:
FORREST BROS., Forrest Bldg.

NEW FAST COTTON DYES

The latest improvements in Fast Red, Pink and Orange Dyes for cotton:

NAPHTOL A. S.
NAPHTOL B. S.
NAPHTOL FAST RED GL

(For Printing)

together with the necessary bases for developing on the fibre. These dyes are fast to light, chlorine and alkalies and replace Vat Dyeing Reds, Scarlets and Pinks, also Alizarine and Paranitraniline, Primuline and Rosanthrenes.

Owing to their extreme fastness, these products are admirably adapted for shirtings.

Samples and full particulars will be gladly furnished to interested parties.

A. KLIPSTEIN & COMPANY

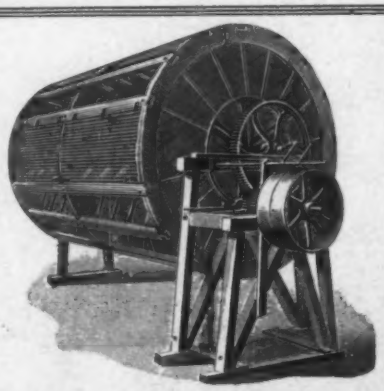
644-652 GREENWICH STREET NEW YORK CITY

DYE HOUSE MACHINERY

Oxidizers are built with spur gear and also with worm gear drive. Also makers of Dye Machines, Oxidizers, Tom-Toms, and dye house machinery, to specifications.

Write us.

SALEM IRON WORKS,
Winston-Salem, N. C.



Liquid E B G Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y.

Main office 19 East 41st Street New York. *Chicago office* 11 So. La Salle St.

Starch

EFFICIENCY and ECONOMY are the watchwords today. Modern mill men who hold to this motto are discarding ordinary, imperfectly refined starches and selecting those special types best suited for their individual conditions.

Some desire increased weight, all need increased strength and better weaving qualities for the warp.

You know the result you seek.

We know and can provide the proper type of Starch.

400 MILL	EAGLE ★★★	FAMOUS N
500 MILL	EAGLE ★★	C. P. SPECIAL
	EAGLE ★	
	EAGLE	

BLUE RIVER CRYSTAL

BLEACHING and FINISHING PLANTS have learned that "any old" STARCH or DEXTRINE will not do the work. To secure the proper "feel" the desired weight, the attractive finish, careful discrimination must be exercised in selecting.

STARCHES and DEXTRINES

We manufacture all approved varieties.

90 THIN BOILING CRYSTAL

162 GUM 163 GUM

DEXTRINES and BRITISH GUMS

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

JACQUES WOLF & CO.

Manufacturing Chemists and Importers

PASSAIC, N. J.

ALL SIZING AND FINISHING PRODUCTS

For Cotton

HYDROSULPHITE
For stripping and discharge printing

INDIGOLITE
For indigo discharge.

BENSAPOL
BLEACHING OIL
CREAM SOFTENERS
GLASGOW SIZE
LEVULINE
LUSTROSE
SOLUBLE OILS
WHITE FINISH

MONOPOLE OIL
Reg. Trade Mark No. 70991.

TEXTILE

STARCHES

THIN BOILING

WHITE OAK
ECLIPSE
RADIO

These Three Brands comprise all fluidity grades of Thin Boiling Starch.

Through cooperation, we can "fit" the fluidity grade to the Mill Superintendent's actual Starch requirements in Textile Construction and Finish.

Always—Uniform Pure and Clean

A. E. STALEY MFG. CO.
DECATUR, ILLINOIS

"BRETON" MINEROL "F"

For

Cotton Yarns

"It stays on the yarn"

BORNE, SCRYMSER CO.
Established 1874
80 South Street, NEW YORK
BOSTON PHILADELPHIA

Works: Elizabethport, N. J.

ATLANTIC YELLOW G

Has become the accepted standard of American-made Sulphur Yellows, just as ATLANTIC Black B EXTRA has for quite awhile been the accepted standard the world over of Sulphur Black.

We have just added to our line of ATLANTIC colors, ATLANTIC YELLOW R, a Sulphur Yellow identical in all its properties with ATLANTIC YELLOW G, except that it is much redder in shade, and is, therefore, better suited for shading tans and browns.

Atlantic Dyestuff Company

WORKS: PORTSMOUTH and BURRAGE
MAIN OFFICE, BOSTON
NEW YORK PHILADELPHIA CHARLOTTE
CHICAGO PROVIDENCE

IN DOUBT? ASK US

We will be glad to give you the best advise available from our many years' experience as specialists in the manufacture of

BRUSHES

For Textile Purposes

For years we have been manufacturing BRUSHES for this purpose in ever increasing quantities.

This long steady growth is but one of the indications of the continuous service we have been rendering to the TEXTILE INDUSTRY.

OUR REPAIR DEPARTMENT

Has been greatly enlarged. We are prepared to do REPAIR WORK on a larger scale, rendering PROMPT and SATISFACTORY SERVICE.

OUR CATALOG IS A VALUABLE REFERENCE BOOK. HAVE YOU ONE?

ATLANTA BRUSH CO.

Successors to D. D. Felton Brush Co.

Central & Trinity Aves.

ATLANTA, GA.

When a Man's Mouth Is Dry as Dust

A BLISTERING summer sun outside—inside the mill a parching heat that dries the sweat on a man's face and makes his tongue thick and dusty—and his mind is on his desire for a long slow drink of fresh cold water, and not on his job.

Can you estimate the improvement in his work when he steps over to the QUICKOOL, takes a mouthful of clean cold water and lets it gurgle refreshingly down his hot dry throat.

THE QUICKOOL
DRINKING FOUNTAIN

will pay for itself in a single summer in increased employee efficiency. And it is inexpensive to operate. It holds 75 to 100 pounds of ice—any kind, since it cannot touch or contaminate the water. The cork-insulated ice chest keeps the cold air in and the warm air out; ice lasts longer. Each QUICKOOL is equipped with the "Protectajet" Bubbler which, as the illustration above shows, automatically keeps the jet opening covered all the time, protecting it from backfall of water, from perspiration and dust. It is perfectly sanitary. The QUICKOOL is the all-year-round drinking fountain.

We should like to tell you more about its cost.

The CENTRAL BRASS MFG. CO. of CLEVELAND

SMITH & FURBUSH
MACHINE CO.
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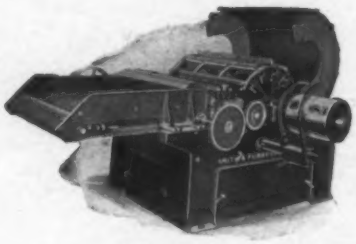
Specialists in machinery for working all kinds of Waste Products. Complete equipment for coarse yarns, etc., from waste. Shoddy, Felting and Woolen machinery.



Jute Picker
Send for Circular S-166

This machine is used for shredding or hackling out Gunny and Burlap bagging.

It is used as a part of our outfit for the manufacture of gunny sacking from scrap bagging.

HARRIS
Steel Clad Broom

PATENTED

The Best Broom in the Market
The Cheapest Broom in the Market
Will You Profit by Using It?

The Factory Broom Universal

Order a Sample
Package on Approval

PRICE LIST
24 LB. MILL BROOM $3.75 PER DOZ.
32 LB. FACTORY BROOM $3.75 PER DOZ.

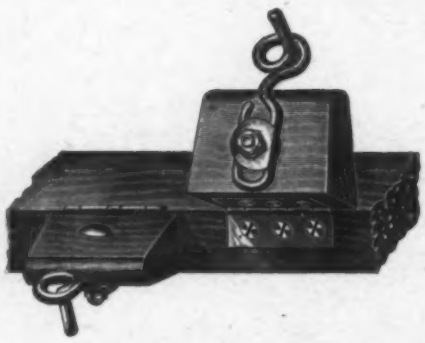
All Broom Corn or
Filled with Bamboo
F. O. B. CHICAGO

GUARANTEE:
We will guarantee this broom to be the equal or better than any broom on the market and sold subject to your approval.

Wire or mail your order.

THE HARRIS BROOM COMPANY
321 E. Grand Ave. CHICAGO

The Palmer Adjustible Thread Guide



For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY
Middletown, - - - Connecticut

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

MANUFACTURERS OF
Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

A Comparison of Drinking Fountain Streams

Vertical Stream Bubbler Condemned Everywhere

Camouflaged Vertical Stream

Rainbow stream. Hose-like. difficult to drink from.

No. 1 shows the vertical stream which permits saliva and waste water from the drinker's mouth to fall back to the source of supply. No longer considered sanitary.

No. 2. is a slight modification of vertical stream type. This slight angle is little if any improvement over No. 1.

No. 3 is more sanitary if properly used. But stream is hose-like with no definite drinking point. Drinker places mouth as near water outlet as possible. Unsanitary like Nos. 1 and 2.

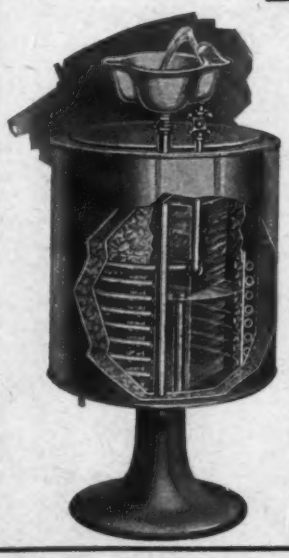
The Puritan Cantonment "Mound Building" Stream

Practical drinking mound is formed by mechanical means. Interference is set up in stream which retards water movement at the apex of arc. This stream makes it impractical to drink from any other point.

Approved by U.S. Government. Now recognized by largest interests and schools in the country.

—Definite Drinking Point.

—Sanitary and Practical.



Puritan CANTONMENT DRINKING FOUNTAINS

Puritan "Cantonment" Coolers are designed to connect to pressure lines and are so constructed that the drinking water does not come in direct contact with either the ice or ice water, but is circulated through brass coil which is tinned both inside and outside.

With 2-stream "Mound Building" Projector this cooler is the most efficient and sanitary of its kind on the market.

WRITE FOR ILLUSTRATED LITERATURE NOW.

Halsey W. Taylor Company

Warren, :: :: :: Ohio

Labor Lessened is Money Saved

Quick, easy transportation in and about your plant is a vital item. Excess time or labor means expense. Save it.

Diamond Fibre Receptacles are systematic savers of lost motion. They pay big dividends—far in excess of their cost. They last for years and continue to pay because they are made of non-splintering non-rusting, practically indestructible Diamond Fibre. We make a full line of these hardy receptacles; trucks, doffing cars, roving cans, waste baskets, barrels, sample cases and many other things.

Write today for literature and let us show you our latest models.

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Dept. 8

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Bridgeport (near Philadelphia), Penna.

Branch Factory and Warehouse: Chicago

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THE SAME set of loom harness makes any cloth when you weave with

"DUPLEX" FLAT STEEL LOOM HARNESS

Let us quote you

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

111 Washington St. Greenville, S. C.

Hampton Smith, Southern Manager.

THE

"Southwestern Iron Clad"

Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through
all principal distributors.

The Southwestern Broom Mfg. Co.
Evansville, Indiana

A Refreshing Healthful Drink

A man goes back to his work with renewed energy after a refreshing drink of water.
It is up to you to provide the means whereby he can get that drink.
In choosing a fountain, follow the dictates of science.
Professor Clark of the University of Wisconsin has definitely proven the **vertical** stream fountain to be a menace—a spreader of disease.
No such danger exists in the

Rundle-Spence "Vertico-Slant" Cooler Fountains

LIPS CANNOT TOUCH THE NOZZLE which is raised only slightly above the sloping base of recess. The copious drinking feature of the vertical stream is retained in the Vertico-Slant, as the mouth comes in contact with the stream at a point where it loses its momentum.
Glass or cup can be filled easily from this stream.
The fountain that prevents squirting, tampering or pilfering, and uses less water than the average old-style globe shaped drinking fountain.
The Vertico-Slant Cooler Fountain has a galvanized coil through which water passes to drinking head without coming in contact with ice. The walls are insulated with cork, making a great saving in ice.
If you have not decided in favor of drinking fountains—do it now. Write today for our new 74-page catalog.

Rundle-Spence Mfg. Co.
MILWAUKEE, WIS.

Are Sales Off?

Are you storing your finished product ready to make "Immediate Delivery?"

J. D. COLLINS
STORAGE EQUIPMENT
926 GRANT BLDG.,
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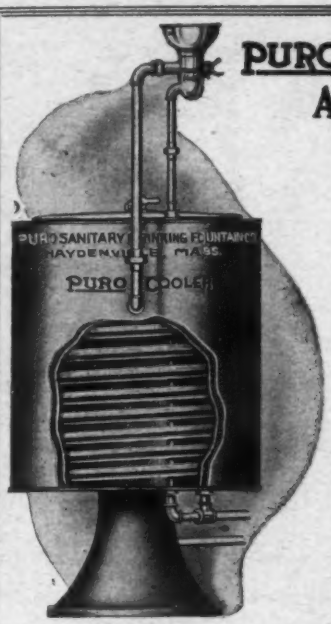
has the equipment that will reduce your storage and handling expenses. Tiering machines, Electric and hand trucks, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request.



PURO SANITARY DRINKING FOUNTAINS ARE NO LONGER A LUXURY

The up-to-date- manufacturer found out that they are time savers—save time by reducing loss of time on account of sickness among your employees—and save time by having a cool drink of pure water available at all times.

PURO Drinking Fountains are cast bronze metal—beautifully nickel plated—so simple that even a child can operate it—yet—there is nothing to get out of order.

For Your Own Protection Install PURO Sanitary Drinking Fountains.

Southern Sales Manager
E. S. PLAYER
Masonic Building
Greenville, S. C.

Manufactured Exclusively by

PURO SANITARY DRINKING FOUNTAIN CO.
HAYDENVILLE, MASS., U. S. A.

Keep the Employes You Have

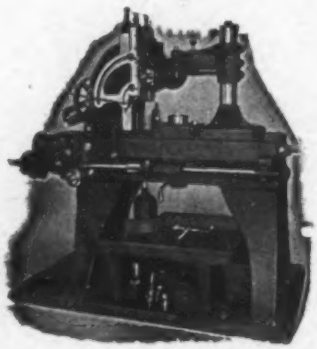
GIVE THEM THE CONVENIENCES THEY WANT

DRINKING FOUNTAINS
GROUP WASH BOWLS, Etc., Etc.

MANUFACTURING EQUIPMENT & ENGINEERING COMPANY
136 Federal St., Boston, Mass.
Address all communications to Framingham, Mass.

FULL AUTOMATIC, SEMI-AUTOMATIC and HAND OPERATED

Gear Cutting Machines!



Especially Adapted for Use in

Cotton Mills.

Hundreds Now in Use.

Send for special circulars.

The D. E. Whiton Machine Company

New London, Conn.

FIBRE BRUSH FOR SWEEPING

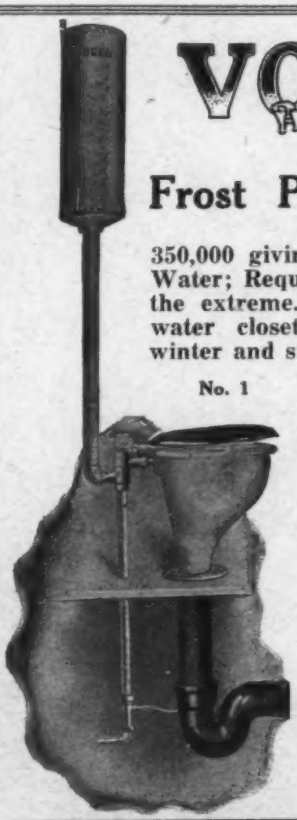
A Clean Mill To Work In

Means contented workmen, and contented workmen means better work and more of it. Coincident with the wave of receding wages that is sweeping over the land far-seeing employers are taking heed of the little things that go far toward making their employees contented and not the least of these is to keep the working place clean and inviting.

The "Two-in-One" Combination Sweep and Scrubbing Brush fits into the new requirements of the times because it is made to lessen toil and do effective work at the same time. Its use in any mill or workshop means absolute cleanliness, a big saving in labor cost, and minimum outlay in replacement. Write for catalogue and price list of brooms and brushes of all kinds.

SOUTHERN BRUSH AND BROOM COMPANY,

601 Citizens & Southern Bank Bldg., Atlanta, Ga.



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Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

No. 1

Enameled Roll flushing rim bowls.

Heavy brass valves.

Strong hardwood seat.

Galvanized tank.

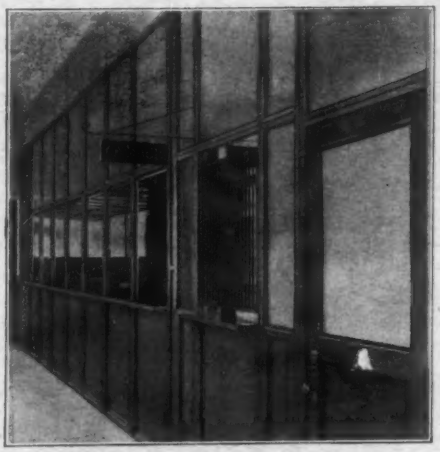
Malleable seat castings will not break.

Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO.

WILMINGTON DELAWARE



How SANYMETAL meets the need of a stock and parts department and cashier's window.

Sanymetal

TRADE MARK U. S. REG.

All-Purpose Partitions

No matter what partition need confronts you in your mill, SANYMETL answers it promptly and permanently.

Partitions for main offices, department and foremen's offices, stock rooms, warehouses, toilets, plant hospitals, etc.—these come in electrically welded unit sections, ready to put in place, by a simple system of concealed bolts that hold them as rigid as the structural steel columns of your mill. *And when* need of moving or changing SANYMETAL arises, the job is easy; even the shape of the layout may be altered.

Sanymetal

TRADE MARK U. S. REG.

are made of heavy gauge steel—the toilet partitions of rust-resisting Armco Iron. They are finished with baked-on enamel rubbed to a fine metal furniture finish. They are designed the same on both sides, and without cracks to catch dirt or moisture.

We have made SANYMETAL honestly, as good as it can be made. That is why it serves industry honestly in hundreds of plants.

We have a new booklet for you telling of some of the unusual things we do to make SANYMETAL outlast your mill.

THE Sanymetal PRODUCTS COMPANY

TRADE MARK U. S. REG.

980 East 64th Street - Cleveland, Ohio

NON-FLUID OIL

"I Have Never Seen a Speck on Cloth from NON-FLUID OIL"

said a prominent Overseer at a recent sectional meeting of the Southern Textile Association.

When asked what grade he used he named

A No. 00000

TRADE MARK NON-FLUID OIL REGISTERED IN UNITED STATES PATENT OFFICE

which many mill men now call the "All Purpose" grade.

To an increasing extent Mills are standardizing on a No. 00000 Grade of NON-FLUID OIL as a general lubricant for all carding, spinning and weaving machinery, as well as shafting, motors, etc.

They find that it greatly simplifies the oiling problem. A single lubricant replaces several kinds of oil such as Machine Oil, Loom Oil, Motor Oil, Shafting Oil, etc.

Then again this grade lasts three to five times as long as ordinary liquid oil—causing a great saving in lubricant used and stretching the intervals between oilings, so that one man can do the oiling for twice as many machines and have time to give the work better attention.

May we send you a sample of A No. 00000 and tell you just where you can use this grade? Coupon is the short way.

New York & New Jersey Lubricant Co.

401 Broadway **New York**

Southern Agent:
Lewis W. Thomason,
Charlotte, N. C.

Ample Stocks at Our Branches
Atlanta, Ga.
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New Orleans, La.

N. Y. & N. J. Lubricant Co.
Please send Testing Samples and Bulletin on "Lubrication of Textile Machinery" to

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The greater strength of SIGNODE TIES together with the use of SIGNODE TIE FASTENERS makes REBOUND impossible. No jagged tie ends to tear the hands.

Saves time, labor and material cost

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The bearing friction of apron and evener rolls causes the evener belt to slip. This makes a thin place in the lap.

Put ball bearings on the evener and apron rolls and eliminate the friction that causes belts to slip, and you will get a much more uniform lap.

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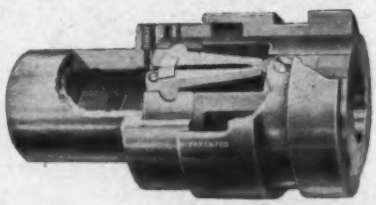
A Better Control for Textile Machinery

You will find the Johnson Clutch a most satisfactory means of driving textile machinery. More efficient and more convenient than the tight and loose pulley. Equally desirable on motor drives.

Made in both single and double types to fit standard pulley sizes. Clean, compact and durable. Grips smoothly and is easily adjusted to any tension.

Ask for the Johnson Clutch on your new machine equipment.

Ask for our Catalog "G"



Single Clutch Broken Away.

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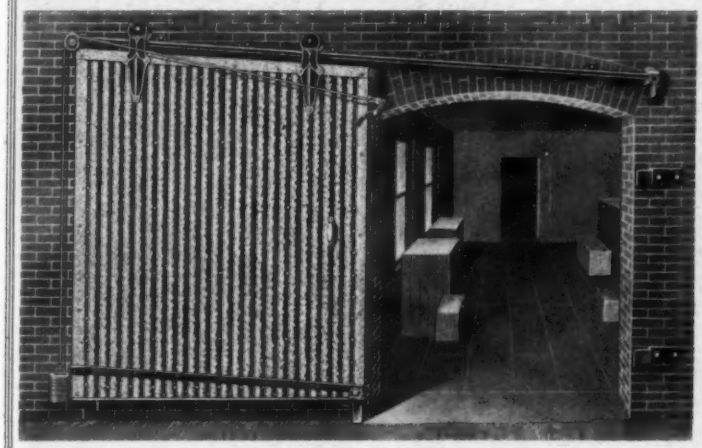
Richards-Wilcox fire doors are real insurance against the greatest loss from fire—the loss of operating time while damaged buildings are being reconstructed.

Warehouses, mills, and other big industrial buildings, with a high natural fire hazard, are not safe or properly equipped until Richards-Wilcox fire doors are installed.



All R-W fire door construction is made to specifications drawn by our own Engineers to meet the absolute requirements of perfect protection in the plants in which they are used.

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Richards-Wilcox Mfg. Co.
A Hanger for any Door that Slides
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POWER RANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

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Painting

LET us furnish estimates on your painting. We can refer you to scores of big mills throughout the United States that we have painted.

Write or phone us today.

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THREE outstanding features make Dixielite the leading finish for walls and ceilings of mills, factories, and warehouses.

First, Dixielite is white. Not a near-white, but a pure, bright white that distributes evenly, every ray of daylight to the furthest and darkest corners.

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It is the perfect white finish for walls and ceilings—a product with over seventy years of experience back of it. And it is made by one of the oldest paint and varnish makers in the country. Write today for Booklet No. 51.

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Top floor showing concrete saw tooth roof. Concrete columns only nine inches octagonal. Stewart Silk Company mill at Easton, Pa.

Essentially a Textile Building

Thompson & Binger's contribution to this new mill was more than engineering and construction skill. We contributed practical textile experience to the design which makes this building essentially a textile mill.

Incidentally, this building was designed and constructed on a single contract, on the cost-plus basis, and delivered to its owner for **less than estimated cost.**

5 At present we are constructing buildings in five states.

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The three outstanding facts in modern mill construction

1st. A marked effort to secure 100% safety, sanitation and comfort in all mill construction.

2nd. A distinct turning to reinforced concrete to meet these demands.

3rd. The almost invariable use, as the "mineral aggregate," of

"ENSLEY" & "ALA CITY"
BASIC SLAG
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Post war conditions with its keen competition demand not only the most favorable equipment but also the most efficient labor production.

To escure this efficiency, Safety, Sanitation and comfort are combined—in reinforced slag concrete structures—with absolute protection against vermin and fire. In line with the general trend we have made substantial reductions in "Ensley Basic Slag" and "Ala. City Basic Slag." The time to start that new construction is now—write for new price list, effective May 1st.

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"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

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the lasting material for roofs of industrial plants

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Roofkoter lasts for a minimum of five years. It covers an unusually large surface—a single gallon covers from 50 to 75 square feet on composition, tar and gravel or concrete surface. On metal surfaces a single gallon covers from 75 to 100 feet.

Roofkoter is a combination of asbestos fibre and other protective weather and wear resisting materials. It can be easily applied right over your old roofs. And any unskilled laborer can do the work efficiently and well.

Roofkoter has proved its economy and durability on millions of square feet of roof surface for many of the country's greatest industries.

May we send you our valuable little booklet "How Pennies Protect Your Dollars."

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The Great Falls Manufacturing Company's mill at Somersworth, N. H., is the development of nearly a century. The problems of adapting the plant to changing conditions were as numerous as might be expected in a plant of such age.

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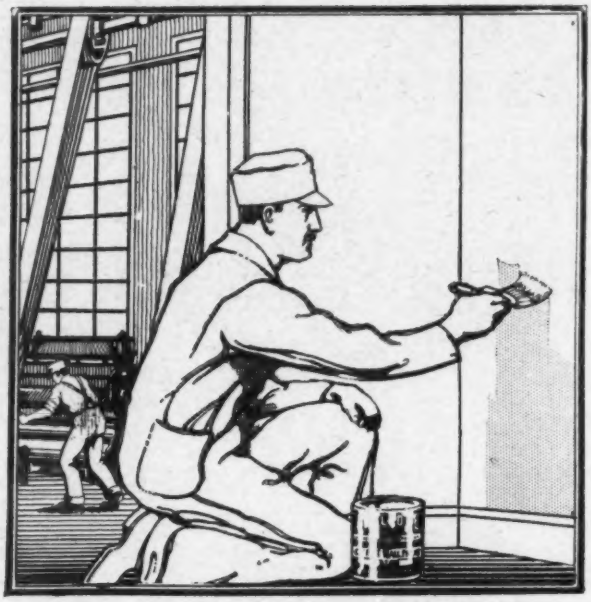

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C-H PERMA-WHITE

A gloss mill white that stays white

Floods every nook and corner with daylight

C-H Perma-White stays permanently white because it does not easily collect dirt and will not discolor. Its smooth surface is easily washed. Figured by the years of service C-H Perma-White is very economical.

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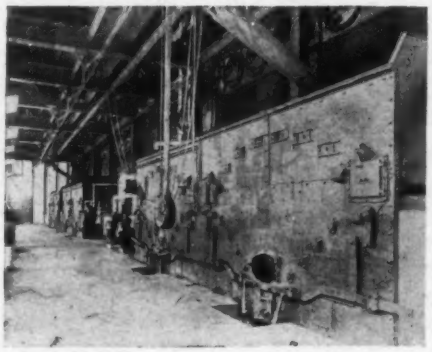
SAVANNAH

Detroit Stokers



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in U. S. Industrial Alcohol Co., Curtis Bay, Maryland

Twenty-two Detroit "V" Type Stokers, 12,000 H. P., are doing satisfactory service in the U. S. Alcohol plant at Curtis Bay, Maryland. These Stokers were installed on four orders as follows:

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Second order Oct. 1915—2—300 H.P.
Third order June 1917—6—500 H.P.
Fourth order June 1917—6—500H.P.

This proves that Detroit Stokers are recognized by this company as a paying investment. Detroit Stokers effect bigger savings in labor and fuel cost over hand firing methods, besides making it easy to secure higher boiler ratings. You owe it to the successful operation of your plant to investigate Detroit Stokers.

Our free Engineering Service will help you solve your power production problems. Write for our illustrated catalog.

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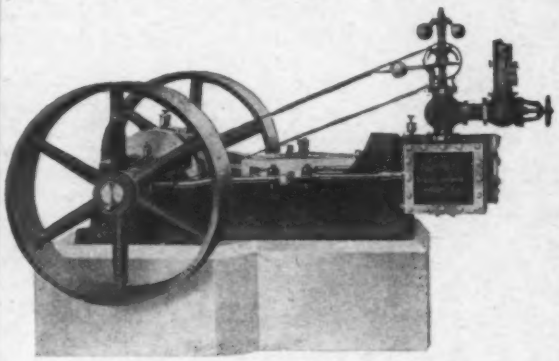

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OUR SERVICE SAVES TIME AND MONEY

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Many mills know through experience that should a machine breakdown occur, it can be put back in operation quickly by calling on AUTOGENOUS.

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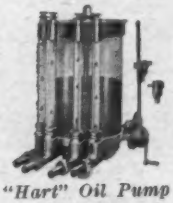

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Have you received a copy of the Sherwood Book? It is well worth reading. It describes all Sherwood products, including injectors, ejectors, oil pumps, flue cleaners — a complete line of power plant equipment ranging from fusible plugs to grease cups.
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Demand Sherwood Engineering Specialties which have proven their worth in actual service over a long period of years.

Many Sherwood products have been in daily operation for 5, 10, 20 and 25 years.

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Sole Manufacturers of Sherwood Engineering Specialties

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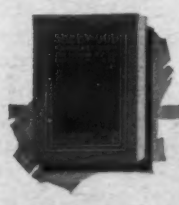

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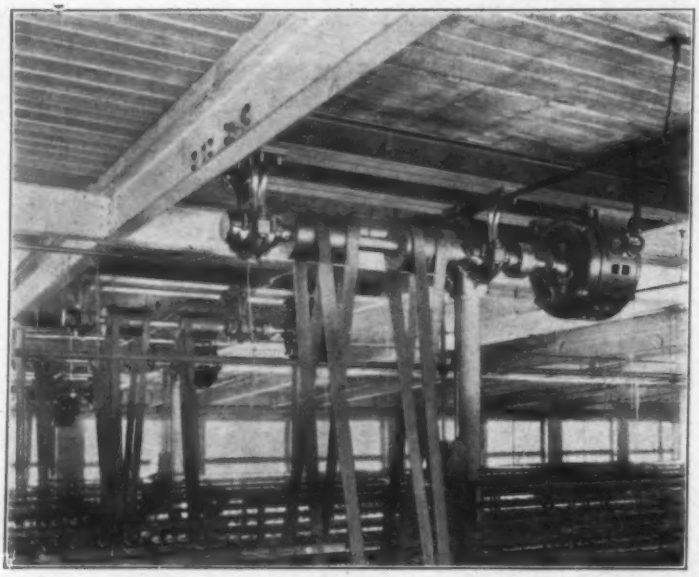

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For The Electrification of Old Mills

Avoids Shifting of Frames

The equipment consists of a special spinning frame motor for ceiling suspension equipped with conduit terminal box; bushing type flexible coupling; adjustable hangers; shaft with paper pulleys for driving four spinning frames.

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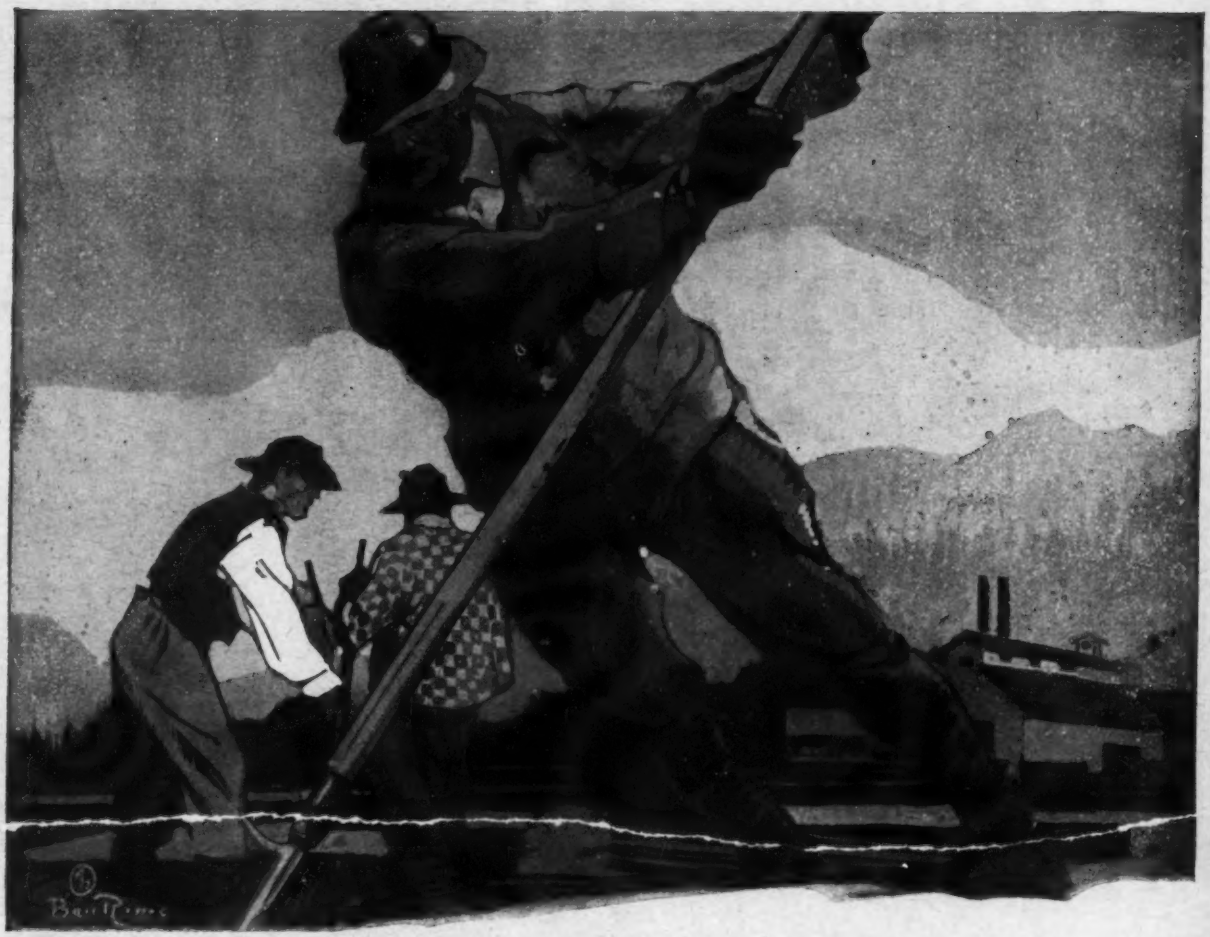
Let us help you find the things you need. Look first through the advertising pages of COTTON, then if what you want is not advertised write us.

We promise to give you immediate service. We know that we can be of assistance to you.

Cotton, Grant Bldg., Atlanta



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KIPLING rightly called her *The Land that was Born Lucky.* For Canada has the greatest reservoir of natural wealth in the world—vast forests, mountains of minerals and millions of acres of untilled arable land. She is building wisely with her wealth, exporting part of her surplus in exchange for the things she needs.

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ATLANTA, GA.

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in the South,
and especially in Georgia

You need The Citizens & Southern

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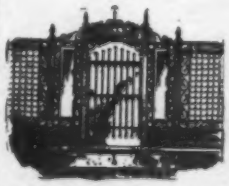

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27 250-K. V. A. Westinghouse Outdoor Type Transformers, 2300-460 volt, 60 cycle, single phase, Spec. No. 159463-A.

18 250-K. V. A. Allis-Chalmers Outdoor Type Transformers 2300-230/440 volt, 60 cycle, single phase.

3 100-K. V. A. Westinghouse S. K. Transformers, Outdoor Type, 6600 volt—2200/2000, 60 cycle, single phase.

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5 500 H.P. Keeler Water Tube Boilers, 160 lb. pressure. Wetzel stokers.

48 823 H.P. Sterling Boilers, type M-30, 200 lbs. pressure. Westinghouse S retort stokers, Vulcan soot cleaners, Bailey flow meters, forced draft fans, 100,000 of capacity direct connected to steam turbines.

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10 14-in. Worthington, Class B double suction, 8,600 g.p.m. at 152 ft. head, direct connected to 300 H.P. General Electric 3 phase, 60 cycle, 2,300 volt, 1,700 r.p.m. motors.

4 14-in. Allis-Chalmers Type S 7,500 g.p.m. at 130 ft. head, direct connected to 150 H.P. General Electric 3 phase, 60 cycle, 2,300 volt motors.

2 10-in Allis-Chalmers Type S 3,750 g.p.m., 130 ft. head, direct connected to 100 H.P. General Electric 3 phase, 60 cycle, 2,300 volt motors.

2 8-in. Allis-Chalmers Type S 1,850 g.p.m., 150 ft. head, direct connected to 100 H.P., 2 phase, 60 cycle, 2,300 volt motors.

3 6-in. A. W. W. 100 g.p.m., 125 lb. pressure, direct connected to 150 H.P. Westinghouse 3 phase, 60 cycle, 3,200 volt, 1,765 r.p.m. motors.

Steam Turbine Driven Centrifugal:

6 16-in. Allis-Chalmers Type S, 8,500 g.p.m. at 90 ft. head, direct connected to Type L, 2,000 r.p.m. steam turbine.

6 14-in. Allis-Chalmers Type S, 6,500 g.p.m. at 150 ft. head, 8,100 g.p.m. at 90 ft. head, direct connected to 200 r.p.m. steam turbines.

Steam Actuated Hydraulic:

6 14 and 20 x 7½ x 18 Worthington Compound Duplex outside and pocket plunger, 400 g.p.m. at 800 lb. pressure.

10 25 and 38 x 4½ x 24 Worthington Tandem Compound Duplex, outside end pocket, 3,600 lb. pressure, 150 g.p.m. at 20 r.p.m.

2 20 x 12 x 16 Worthington Duplex Underwriters Fire Pumps, 1,500 g.p.m.

200 Boiler Feed Worthington Pumps, 3 x 2 x 3, 4½ x 2¾, x 5, 5½ x 3½ x 5, 6 x 4 x 6 and 12 x 7 x 10.

NASHVILLE INDUSTRIAL CORPORATION

OLD HICKORY, TENN.

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U. S. Ball Bearing Co.

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Draper Corporation.
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Hulme, J. S.
Saco-Lowell Shops.

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Hyatt Roller Bearing Co.
S K F Industries.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
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Belt Conveyors.
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Morse Chain Co.
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Walraven Co.
Williams & Co., I. B.

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Belt Lacing.
Augusta Mill Supply Co.
Flexible Steel Lacing Co.
Walraven Co.

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Blowers and Blower Systems.
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Bobbins.
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Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Walraven Co.
Whitin Machine Works.

Bobbin Heads.
Diamond State Fibre Co.

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International Engineering Works, Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
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Toomey, Frank.
Walsh & Weidner Boiler Co.

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Permutit Co.
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Lane & Bros., W. T.
Standard Fibre Co.

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Harris Broom Co.
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Southwestern Broom Mfg. Co.

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General Electric Co.
Westinghouse Elec. & Mfg. Co.

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Link-Belt Company.

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Building Material.
American Cast Iron Pipe Co
American Roofing & Paint Co.
Anchor Post Iron Works.
Atlantic Drier & Varnish Co.
Barrett Co., The.
Birmingham Slag Co.
Detroit Steel Products Co.
Dowman, Geo.
Dufur & Co.
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Seawell, Luke.
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Burr Pickers.
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Carter Electric Co.

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Diamond State Fibre Co.
Standard Fibre Co.

Canvas Lugs.
Augusta Mill Supply Co.

Cars and Trucks—Fibre.
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Car Unloaders.
Portable Machinery Co.

Carbonizing Machines.
Cocker Mch. & Fdry Co.
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Philadelphia Drying Mchry. Co.
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Salem Iron Wks.
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Howard Bros. Mfg. Co.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
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Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
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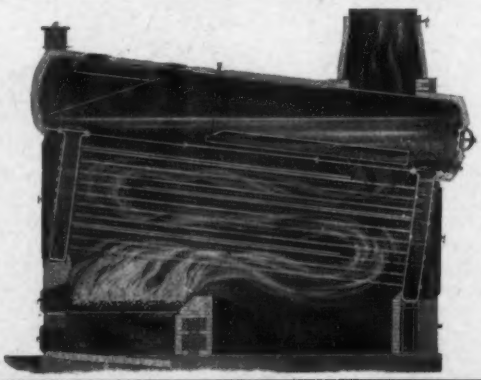

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Condulets.
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National Metal Molding Co.

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Marshall Co., H. Newton.

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Marshall Co., H. Newton.

Contractors (Roofing.)
American Roofing & Paint Co.
Marshall Co., H. Newton.

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Proctor & Schwartz, Inc.
Portable Machinery Co.
Richards-Wilcox Mfg. Co.
Schofield, Wm. Co.
Walraven Co.

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Portable Machinery Co.

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Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

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Sanitas Co.

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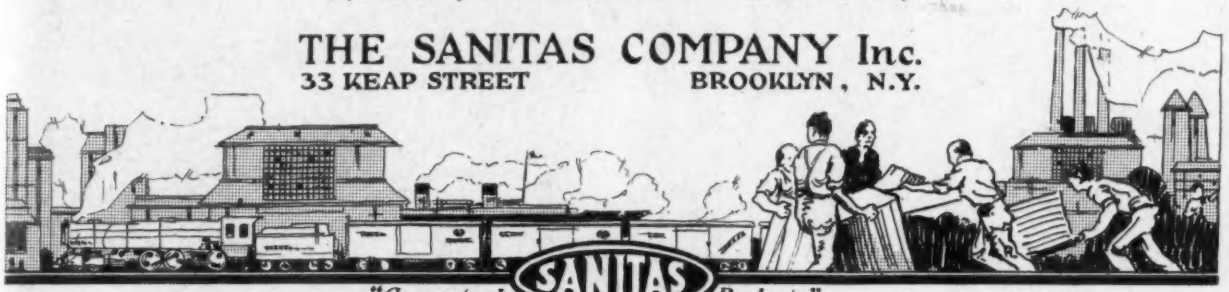

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(See Lubricants).

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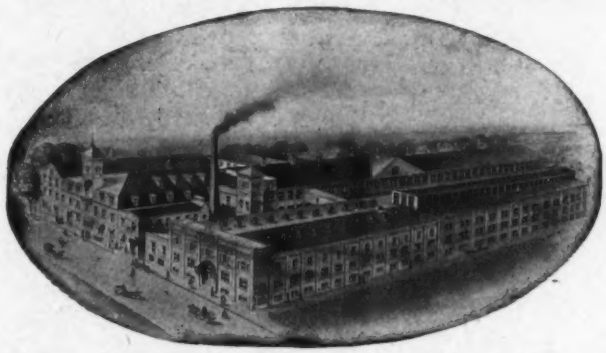

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Paulus, Chas. B.

Office Partitions.
Sanymetal Products Co.

Oils.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Southern Cotton Oil Co.
Wadsworth, Howland & Co., Inc.

Oils—Finishing.
(See Finishing and Sizing Materials).

Oils—Lubricating.
(See Lubricants).

Oil Cups.
(See Lubricators).

Oil Paper.
Bradley Mfg. Co., A. J.

Oiling Devices.
(See Lubricators).

Openers for Cotton, Wool, Waste, Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Overhead Carriers.
Dowman, George.

Oxidizing Machinery.
Cocker Mch. & Fdry. Co
Salem Iron Works.
Phila. Drying Machinery Co.

Oxygen.
Commercial Acetylene Supply Co.
Standard Gas Products Co.
Southern Welding Co.

Packing Boxes & Cases—Wooden.
Hightower Box & Tank Co.
National Asso. of Box Mfgrs.
Walke Box Co., Inc.
Wall & Son, O. M.

Packings.
Augusta Mill Supply Co.
Graton & Knight Mfg. Co.
Jenkins Bros.
Walraven Co.

Paint.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co., The.
Coolidge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Southern Distributing Co.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Painting Contractors.
(See Contractors.)

Panel Boards.
(See Switchboards).

Paper.
Bradley Mfg. Co., A. J.
Diamond State Fibre Co.

Partitions (Office and Toilet).
Sanymetal Products Co.

Perforated Metal.
(See Screens and Sieves).

Partitions—Steel.
Dowman, Geo.
Lupton's Sons Co., David

Peroxides.
Roessler & Hasslacher Chemical Co.

Pickers—Curled Hair.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Pickers—Leather.
Augusta Mill Supply Co.
Garland Mfg. Co.

Picker Sticks.
Augusta Mill Supply Co.
Garland Mfg. Co.
Southern Bending Co.
Shambow Shuttle Co.
Walraven Co.

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pinions.
Diamond State Fibre Co.
General Electric Co.

Pipe and Pipe Fittings.
Crane Co.
Grinnell Co., Inc.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walraven Co.

Piping Contractors.
Grinnell Co., Inc.

Pipe Threading and Cutting Machines.
Walraven Co., The.

Playground Apparatus Equipment.
Central Brass Mfg. Co.
Crane Co.
Hill-Standard Co.
Manufacturing Equipment & Engineering Co.
Medart Mfg. Co., Fred.
Pure Sanitary Drinking Fountain Co.
Taylor, Halsey W.

Pneumatic Machinery & Tools.
Curtis Pneumatic Mchry. Co.

Portable Conveyors.
(See Conveyor.)

Power (Electric.)
Georgia Railway & Power Co.

Power Transmission.
Aldrich Mach. Works.
Allis-Chalmers Mfg. Co.
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Carlyle-Johnson Mch. Co.
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Lewellen Mfg. Co.
Link-Belt Company.
Manufacturing Equipment & Engineering Co.
Morse Chain Co.
Russell Mfg. Co.
S K F Industries.
Slaughter Mchry. Co., G. G.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

Pressed Steel.
Lupton's Sons Co., David.

Presses.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Galland-Henning Mfg. Co.
Lovingood Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Pulleys.
Augusta Mill Supply Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Walraven Co., The.
Wood's Sons Co., T. B.

Pulley Covering.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Sydnor Pump & Well C., Inc
Toomey, Frank.
Walraven Co.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

Pump Valves.
(See Valve Discs).

Psychrometers—Sling.
Taylor Instrument Co.

Pyrometers.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Machine Co.
Dufur & Co.

Railroads.
Seaboard Air Line Ry.
Southern Railway.

Receptacles—Fibre.
(See Fibre Products).

Recording Instruments.
Boston Machine Works.
General Electric Co.
Powers Regulator Co.
Service Recorder Co.
Taylor Instrument Co.

Recorders (Machine Service Time).
Service Recorder Co.

Recorders—Temperature.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.
Southern Bending Co.
Shambow Shuttle Co.
Walraven Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

Reflectors—Lamp.
(See Lamp Reflectors).

Regulators—Liquid Level.
General Electric Co.

Regulators—Pressure.
General Electric Co.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers).

Reinforcing Slag.
Birmingham Slag Co.

Repairing—Electrical.
Westinghouse Elec. & Mfg. Co.

Repairing—Textile Machinery, Etc.
Autogenous Welding Co.
General Machine Works.
Osler & Co., W. B.
Southern Spindle & Flyer Co.
Southern Welding Co.
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Sanymetal Products Co.

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Ring Travelers—Steel and Bronze.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

Rings—Spinning.
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Rocker Shaft Bearings.
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Rolls—Calender.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Perkins & Son, B. F.
Roy & Son Co., B. S.
Textile Finishing Machinery Co.

Rolls,—Rubber Covered.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Perkins & Son Co., B. F.
Textile Finishing Machinery Co.

Rolls—Steel.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Perkins & Son, B. F.
Southern Spindle & Flyer Co.
Textile Finishing Machinery Co.

Rolls—Top.
Campbell Mfg. Co.

Roll Repairing.
Osler & Co., W. B.

Roofing.
American Roofing & Paint Co.
Barrett Co., The.
Cooledge & Sons, F. J.
Cortright Metal Roofing Co.
Dowman, George.
Peaslee-Gaulbert Co., Inc.
Wadsworth, Howland & Co.
Walraven Co.

Roof and Cement Coating.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Cooledge & Sons Co., F. J.
Du Pont de Nemours & Co., E. I.
Johnson & Co. Inc., Oliver.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint Co.
Wadsworth, Howland & Co.

Rope—Transmission.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Walraven Co.

Roving Cans and Trucks.
(See Cans—Roving).

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc)

Salt.
Rock Glen Salt Co.

Sanitary Products.
Central Brass Mfg. Co.
Crane Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Sanitas Co.
Taylor, Halsey W.
Thomas Co., F. H.
Vogel Co., Jos. A.

Sash-Window—Steel.
Detroit Steel Products Co.
Dowman, Geo.
Lupton's Sons Co., David.
Seawell, Luke.

Scales.
Lovingood Co.
Toledo Scale Co.

Scale Preventer—Boiler.
(See Boiler Feed Water Purification).

Screens (Moving Picture).
Monarch Theatre Supply Co.
Southern Thetatre Equip. Co.

Screens and Sieves—Perforated.
Erdle Perforating Co.
Link-Belt Company.

Scouring Machinery.
(See Washers (Cloth)

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Second Hand Machinery and Supplies.
Nashville Industrial Corp.
Toomey, Frank, Inc.
Walraven Co.

Sewing Machines.
Merrow Machine Co., The.
Textile Finishing Machinery Co.

Shades—Electric Lamp.
(See Reflectors).

Shafting and Hangers.
Augusta Mill Supply Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.,
Fafnir Bearing Co.
Link-Belt Co.
S K F Industries.
Walraven Co., The.
Wood's Sons Co., T. B.

Shears.
Roy & Sons Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Dowman, George
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Medart Mfg. Co., Fred.
Sanymetal Products Co.
Seawell, Luke.
Vonnegut Hardware Co.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.
Dowman, George

Shingles—Wood.
Southern Cypress Mfg. Asso.

Shipping Room Machinery and Supplies.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Collins, J. D.
Diamond State Fibre Co.
Handy Equip. Corp.
Hightower Box & Tank Co.
Hulme, J. S.
Lane & Bro., W. T.
Lovingood Co.
Mathews Gravity Carrier Co.
Regnas & Co., J. R.
Standard Fibre Co.
Signode System, Inc.
Toledo Scale Co.
Walraven Co., The.
Walke Box Co., Inc.
Wall & Son, C. M.

Shower Baths and Cabinets.
Crane Co.
Sanymetal Product sCo.

Shuttles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Shambow Shuttle Co.
Southern Bending Co.
Walraven Co.

Sinkers.
Paulus, Chas. B.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

Size Box Temperature Controller.
Powers Regulator Co.
Taylor Instrument Co.

Size Kettles.
Butterworth & Sons Co., H. W.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

Sizing and Finishing Compounds.
(See Finishing and Sizing Materials).

Skewers.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Rolled Steel.
Detroit Steel Products Co.
Dowman, George.
Lupton's Sons Co., David.
Seawell, Luke

Slag for Concrete.
Birmingham Slag Co.

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Lovingood Co.
PickensSlasher Hood Co., R. O.
Regnas & Co., J. R.
Saco-Lowell Shops.
Salem Iron Wks.
Textile Finishing Machinery Co., The.

Slasher Tape.
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Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.
Sanymetal Product sCo.
Seawell, Luke.
Vonnegut Hardware Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Soap—Textile.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Dobbins Soap Mfg. Co.
Du Pont de Nemours & Co., E. I.
Kali Mfg. Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Newport Chemical Works.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques.

Soda (Textile, Soda Ash and Boiling.)
Klipstein & Co., A.
Mathieson Alkali Works, Inc.

Softeners—Cotton.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Ford Co., J. B.
Grasselli Chemical Co.
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Mathieson Alkali Works, Inc.
Newport Chemical Works.
Roessler & Hasslacher Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Softeners—Water.
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Solderless Connectors—Frankel.
Westinghouse Elec. & Mfg. Co.

Solvents.
(See Finishing).

Spindles.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Spinners.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Fletcher Works.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Commn. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B
Crompton & Knowles Loom Wks.
Howard & Bullough.
Schamm & Uhlinger.
Saco-Lowell Shops
Whitin Machine Works.

Spinning Rings.
Draper Corporation.
Howard & Bullough.
Greenville Spool & Mfg. Co.
Greist Mfg. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Spinning Tape Specialists.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Campbell Mfg. Co.
Knit Goods Specialty Co.

Spooling Machinery.
Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Spools and Skewers.
Greenville Spool & Mfg. Co.
Shambow Shuttle Co.
Walraven Co.

Sprinkler Systems and Piping.
Grinnell Co., Inc.

Sprinkler Tanks.
(See Tanks, Towers, Etc.).

Sprockets.
Link-Belt Company.
Morse Chain Co.

Stamping—Die Transfer System.
Kaumagraph Co.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

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(See Tanks, Towers, Etc.).

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Steam Engines.
(See Engines—Steam).

Steam Hose.
(See Hose—Fire.)

Steam Pumps.
(See Pumps—Steam).

Steam Traps.
(See Traps—Steam).

Steel Shelving, Doors, Window Partition, Etc)
Detroit Steel Products Co.
Dowman, George.
Lupton's Sons Co., David.
Sanymetal Products Co.
Seawell, Luke.

Steel Lockers.
Medart Mfg. Co., Fred.
Seawell, Luke.

Stencils and Stencil Papers.
(See Stamps and Stencils).

Stencil Brushes.
(See Marking Pots and Brushes).

Stencil Cutting Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Sticks (Picker).
See Picker Sticks.

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation.
Eclipse Textile Devices, Inc.
Hunt Automatic Stop Motion, Inc.
Whitin Mch. Wks.
Wildman Mfg. Co.

Stokers.
Cokal Stoker Co.
Detroit Stoker Co.
Westinghouse Elec. & Mfg. Co.

Storage Racks.
(See Shelving).

Straps—Lug.
Augusta Mill Supply Co.
Garland Mfg. Co.

Strapping.
(See Leather Specialties or Band Strapping).

Street Lighting Fixtures.
Cutter Works, George.

Supplies—General Mill.
Augusta Mill Supply Co.
Hulme, J. S.
Howard Bros. Mfg. Co.
Nashville Industrial Corp.
Regnas & Co., J. R.
Slaughter Machinery Co., G. G.
Southern Distributing Co.
Steel Heddle Mfg. Co.
Walraven Co., The.

Switches—Knife-Elec.
Crouse-Hinds Co.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Switchboards—Panel.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Tables, Chairs, Etc.
Hill-Standard Co.
Manufacturing Equipment & Engineering Co.
Medart Mfg. Co., Fred.

Tag Addressing Machines.
Regnas & Co., J. R.

Tallow.
(See Finishing Materials).

Tanks and Tubs.
Hightower Box & Tank Co.
Lombard Iron Works & Supply Co.
Permutit Co.
National Asso. of Box Mfgrs.
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American Textile Banding Co., Inc.
Barber Mfg. Co.
Knit Goods Specialty Co.
Weimar Brothers.

Tape Looms—Cotton.
Fletcher Works.
Schaum & Uhlinger.

Tape—Slasher.
Lovingood Co.
Regnas & Co., J. R.

Tapes—Spinning and Twisting.
Barber Mfg. Co.
Knit Goods Specialty Co.

Tape Making Machines.
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Telephones—Calling System.
Carter Electric Co.

Temperature Controllers.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Powers Regulator Co.
Sturtevant Co., B. F.
Taylor Instrument Co.

Temples.
Draper Corporation.

Tenters.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

Tenter Frame Guider (Electric).
Blake Electric Mfg. Co.

Textile Machinery.
(See Cotton Mill Machinery).

Theatre Equipment.
Monarch Theatre Supply Co.
Southern Theatre Equip. Co.

Thermometers—All Kinds.
Taylor Instrument Co.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Palmer Co., The I. E.

Time Clocks.
(See Clocks.)

Tiering Machines.
Collins, J. D.
Lovingood Co.
Portable Mchry. Co.
Regnas & Co., J. R.

Ties—Baling.
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Toilets.
Crane Co.
Manufacturing Equipment & Engineering Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Toilet Partitions.
Lupton's Sons Co., David.
Sanymetal Products Co.

Tool Cabinets—Steel.
Lupton's Sons Co., David

Tool Stands—Steel.
Lupton's Sons Co., David

Tools—All Kinds.
Walraven Co., The.

Top Flats Reclothed.
Howard Bros. Mfg. Co.

Towers.
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Tractors—Electric, Industrial.
Collins, J. D.
Regnas & Co., J. R.

Transmission—Power.
(See Power Transmission Machinery).

Transfer Points.
Paulus, Chas. B.

Traps—Return Steam.
American Blower Co.
Morehead Mfg. Co.

Trucks—Auto.
Packard Motor Car Co.

Truck & Wagon Loaders.
Portable Mchry. Co.

Trucks, Baskets, Etc., Canvas.
Lane & Bro., W. T.

Trucks—Electric—Inter.
Collins, J. D.
Regnas & Co., J. R.

Trucks—Hand and Elevating.
Collins, J. D.
Handy Equip. Corp.
Hulme, J. S.
Lovingood Co.
Regnas & Co., J. R.

Trucks—One Man.
Handy Equip. Corp.

Trucks—Fibre—Inter, Etc.
Diamond State Fibre Co.
Standard Fibre Co.

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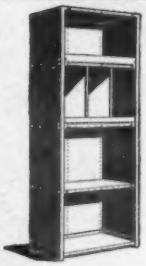

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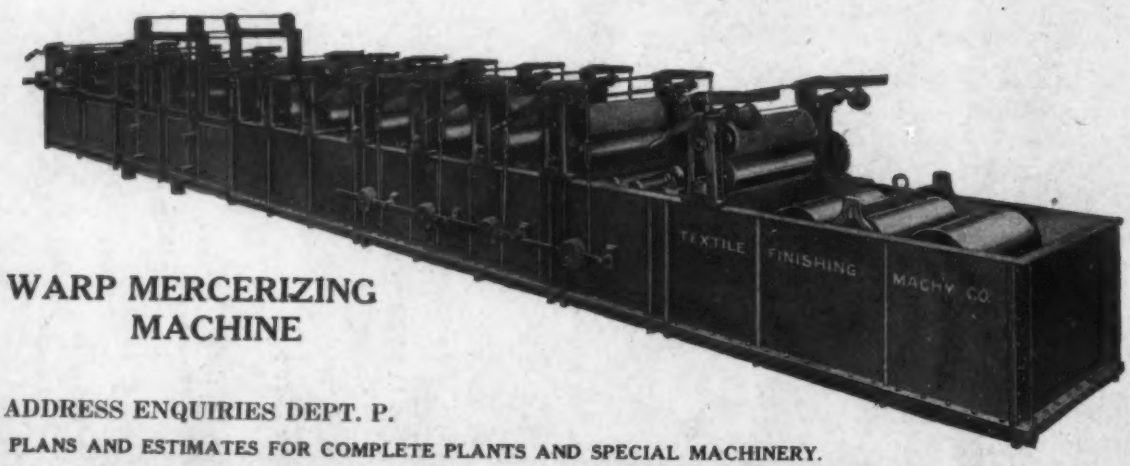

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